Later Neolithic and Early Bronze Age activity at North Fen, Sutton Gault, Cambridgeshire

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Excavations at North Fen, Sutton Gault undertaken in 2010 revealed evidence of significant later Neolithic and Early Bronze Age activity comprising artefact scatters within preserved buried soil deposits and features, including pits, watering holes and ring ditches. Analysis of a substantial later Neolithic flint scatter suggests that during this period the North Fen 'island' was the focus for task-specific activity related, in part at least, to hunting. In contrast, evidence suggests a more long term commitment to place during the Beaker/Early Bronze Age period that resulted in the establishment of watering holes and funerary monuments, which were recorded alongside more tangible evidence of settlement/occupation. In addition, pollen analysis of samples from a watering hole – considered in conjunction with the results of previous palaeoenvironmental work – has provided evidence of a relatively dramatic change in the local environment during the later Neolithic and Early Bronze Age, comprising woodland clearance and an increase in arable activity.

The southern Cambridgeshire Fens and particularly the gravel terraces of the lower Ouse valley is a landscape rich in prehistoric remains and has been the focus of extensive archaeological research over the last 30 years, initially as part of The Fenland Project (Hall 1996) and the Haddenham Environs Project (Evans and Hodder 2006a and 2006b) and more recently through developer-funded excavations resulting from large scale gravel extraction in the area (e.g. Evans *et al.* 2013; Evans *et al.* forthcoming). An excavation at North Fen, Sutton Gault undertaken by Cambridge Archaeological Unit (CAU) represents one of the most recent 'exposures' within this landscape.

Situated on a gravel island *c.* 5km to the south of Chatteris and surrounded by former fen (Fig. 1), the site was excavated in advance of gravel extraction and subsequent irrigation reservoir construction in 2010. Cut off from 'mainland' Chatteris by deep fen deposits, the site sits elevated slightly above the surrounding fen at just 0–1.5m OD; the underlying geology comprises 1st and 2nd terrace river gravels overlying Jurassic clay (British Geological Survey 1980). The excavation revealed artefact scatters within preserved buried soil horizons and features dating to five main phases of activity; the Late Mesolithic, the Early Neolithic, the later Neolithic, the Beaker period and the Early Bronze Age/Collared Urn period. Of these only the later Neolithic and Beaker/Early Bronze Age evidence will be detailed in this paper, with the site's significant earlier Neolithic artefact scatters and pit clusters published separately (Tabor forthcoming). The more ephemeral Late Mesolithic activity comprised a small scatter of flint debitage representing the working of perhaps two or three flint nodules in order to produce blades. Further discussion of the Mesolithic flint assemblage can be found in the site archive (Tabor 2011).

Archaeological background

A number of prehistoric sites were identified in the area by the Fenland Project (Hall 1996), including seven that occupy the North Fen 'island' (Fig. 2). Scatters of worked flint and pottery sherds indicate the location of two Neolithic sites on a 'tongue' of sandy soil on the west of the gravel island (Hall 1996, SUT 1 and 2), while soilmarks and cropmarks are thought to represent the sites of five Bronze Age round barrows (*ibid*., SUT 3–7). Further sites are recorded to the north at Horseley Fen and Langwood Fen where surface finds scatters indicate the locations of three Neolithic sites and at least 15 possible Bronze Age round barrows clustering along the southern fringe of Chatteris island (Hall 1992).

Since the Fenland Project a number of phases of archaeological evaluation and excavation have been undertaken ahead of gravel extraction at the North Fen site (Fig. 2). A round barrow identified by the Fenland Project (SUT 7; Hall 1996), was excavated by the Sutton Conservation Society between 2004 and 2007. The ploughed-out remains of the barrow, which was surrounded by a ring ditch, contained a primary cremation burial held within a Collared Urn and was radiocarbon dated to 1880–1670 cal BC (SUERC-19125: 3440±30 BP, 95% probability [Connor 2009]). Further evidence of prehistoric activity within the quarry was found during trial trench evaluation (Last 1997) and subsequent open area excavation to the north of the 2010 site (Webley and Hiller 2009). A buried soil horizon survived across much of the excavation area and yielded assemblages of worked flint and pottery dat-

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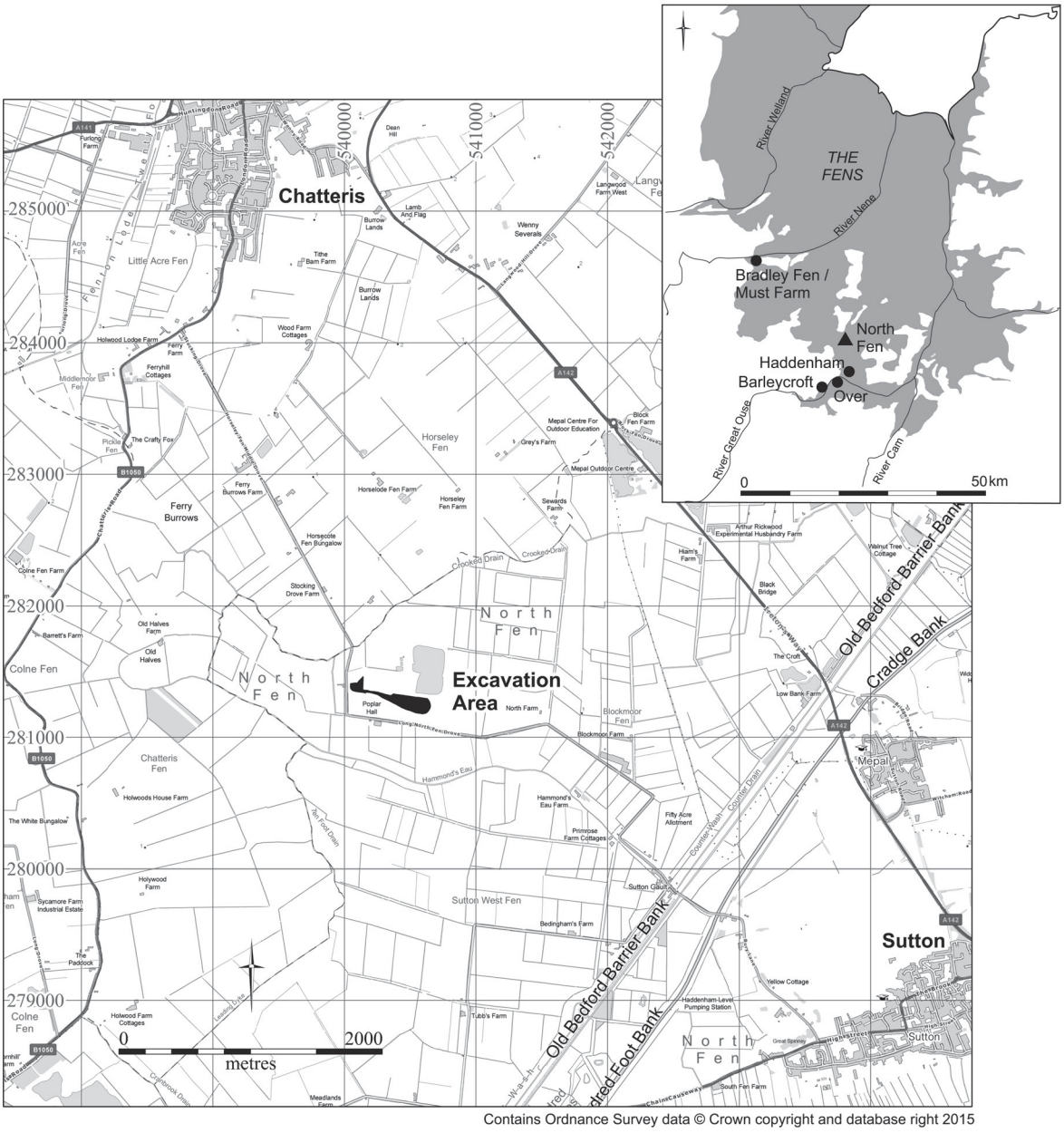

Figure 1. *Site location.*

ing to the Late Neolithic and Early Bronze Age. In addition a watering hole containing a timber revetment was excavated and radiocarbon-dated to 1951–1880 cal BC (OxA-19051: 3559±29 BP, 95% probability [*ibid.*]). Most recently, trial trenching in advance of the current phase of development identified evidence of Late Mesolithic, Late Neolithic and Early Bronze Age occupation (Rees 2010) comprising pits and up to four possible ring-ditches along with quantities of pottery and flint within the buried soil.

The prehistoric environment

North Fen lies at the southern extent of the East Anglian Fenland, as such, environmental factors – namely prehistoric marine incursion and subsequent fen development – are key to understanding the archaeology of the site. Analysis of the sedimentary sequence at two sites along a former channel of the River Ouse – the course of which, in this area, corresponds approximately to the post-medieval drainage ditch Hammond's Eau – suggests that prior to the Neolithic, the adjacent terraces were densely wooded with species such as lime, oak and hazel (Waller 1994). Woodland clearance and cultivation of the river terraces appear to have commenced in the Early Neolithic.

During the later Neolithic/Early Bronze Age however, a major marine incursion, which rapidly spread inland at least as far as Haddenham Fen, dramatically altered the environment leading to flooding

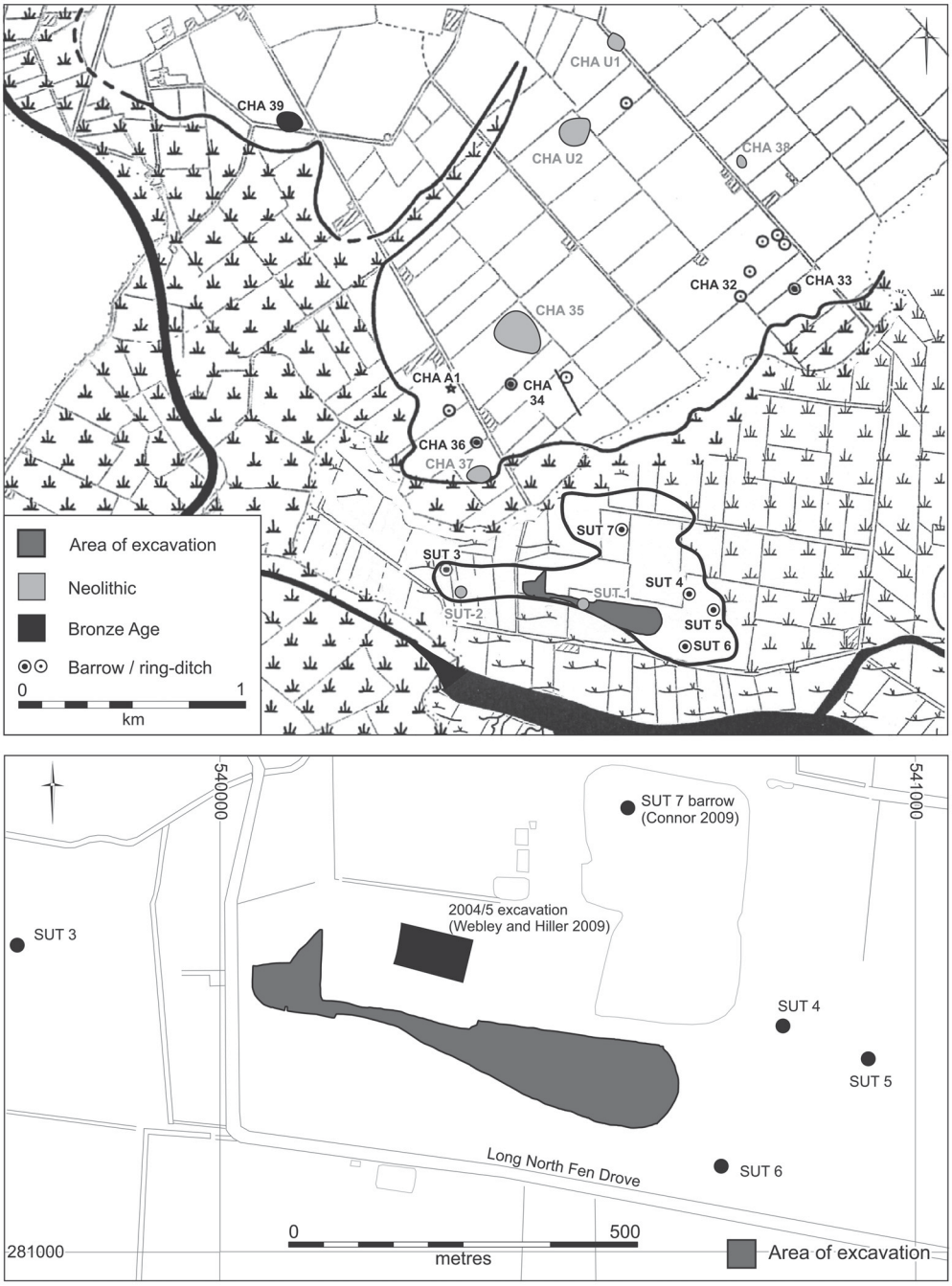

Figure 2. *Neolithic and Early Bronze Age sites in the North Fen locale (top) and previous excavations at North Fen (bottom). Sites identified by the Fenland Project are shown with the original mapping (after Hall 1992, 1996) and with the prefix SUT (Sutton parish) or CHA (Chatteris parish).*

of lower-lying areas and brackish conditions across much of the landscape (Waller 1994). This episode, represented in the sedimentary sequence by 'fen clay', effectively created a landscape of embayments and islands – of which North Fen is one – and resulted in the loss of large areas of previously cultivated low-lying land as well as any remaining forest, which was replaced by fen carr, sedge fen and reed swamp environments. Although the marine influence gradually receded by the Middle Bronze Age, fen conditions persisted into the Late Bronze Age and Iron Age as a result of numerous freshwater flooding episodes. Consequently, while later prehistoric, Roman and medieval sites and findspots are recorded on the 'uplands' of Sutton and Chatteris (at Langwood Farm, for example; Evans 2003) low-lying areas such as North Fen were almost certainly uninhabitable fen during these periods. It was not until land reclamation during the post-medieval period and the construction of major drainage features such as Hammond's Eau and the Old and New Bedford Rivers, that the area was once again suitable for cultivation and habitation.

The excavation

The survival of extensive prehistoric buried soil horizons across large areas of the site resulted in the preservation of *in situ* artefact scatters, which significantly were both spatially and chronologically discrete, and thus gave the evidence a rare sense of clarity, often absent from the multi-period scatters usually encountered at Fenland sites. Of the cut features recorded, all bar one – an isolated later Neolithic pit – dated to the Beaker/Early Bronze Age period and comprised pits, watering holes and two ring-ditches. A complete absence of post-Early Bronze Age evidence (until the post-medieval period) indicates that by the Middle Bronze Age the site was probably uninhabitable due to rising water tables and fen encroachment.

The buried soil

A truncated buried soil comprising the lower half of a complete soil profile (the lower B and C horizons) survived across almost the entire site; more complete buried soil profiles, with partially surviving A horizons, occurred over relatively large areas in the north of the site but were confined to 'pockets' on the sand ridge to the south (Fig. 3).

Soil micromorphology summary (C. French)
Micromorphological analysis of the buried soil indicates that it was throughout, a rather poorly developed brown earth on sand/gravel terrace deposits (see French 2011). The soil sequence was typical of prehistoric fenland and fen-edge buried soil profiles and represents a woodland soil, which was subject to clearance and disturbance, then submergence by peat and/or alluvial deposits, followed by subsequent drainage and the associated humification/oxidation effects. As a result the soil profiles generally were much depleted and few traces of past soil formation sequences and landscape change processes survived. Nevertheless, all of the profiles contained quite a high proportion of very fine humic and charcoal fragments of fine sand size and smaller; also noted by Macphail (2009) with regard to the buried soils encountered in the 2004/5 excavations at North Fen, this 'dirty' aspect to the soil does suggest considerable past human activity on this soil. Indeed the organic 'dust' coating and bridging the grains so markedly in one of the profiles is suggestive of the addition of organic matter to the soil and its possible disturbance and depletion by ploughing (Macphail *et al.* 1990).

Preliminary buried soil artefact sampling comprising a series of north-south transects of 1x1m test pits across the site indicated that the lower buried soil profile – effectively a buried subsoil – contained very low densities of artefacts. In contrast, where more complete buried soil profiles survived (A and upper B horizons) artefact densities were found to be much higher. In these areas more intensive test pit sampling identified five discrete artefact scatters, two of which (Scatters C and D) dated to the later Neolithic/Early Bronze Age and are discussed below.

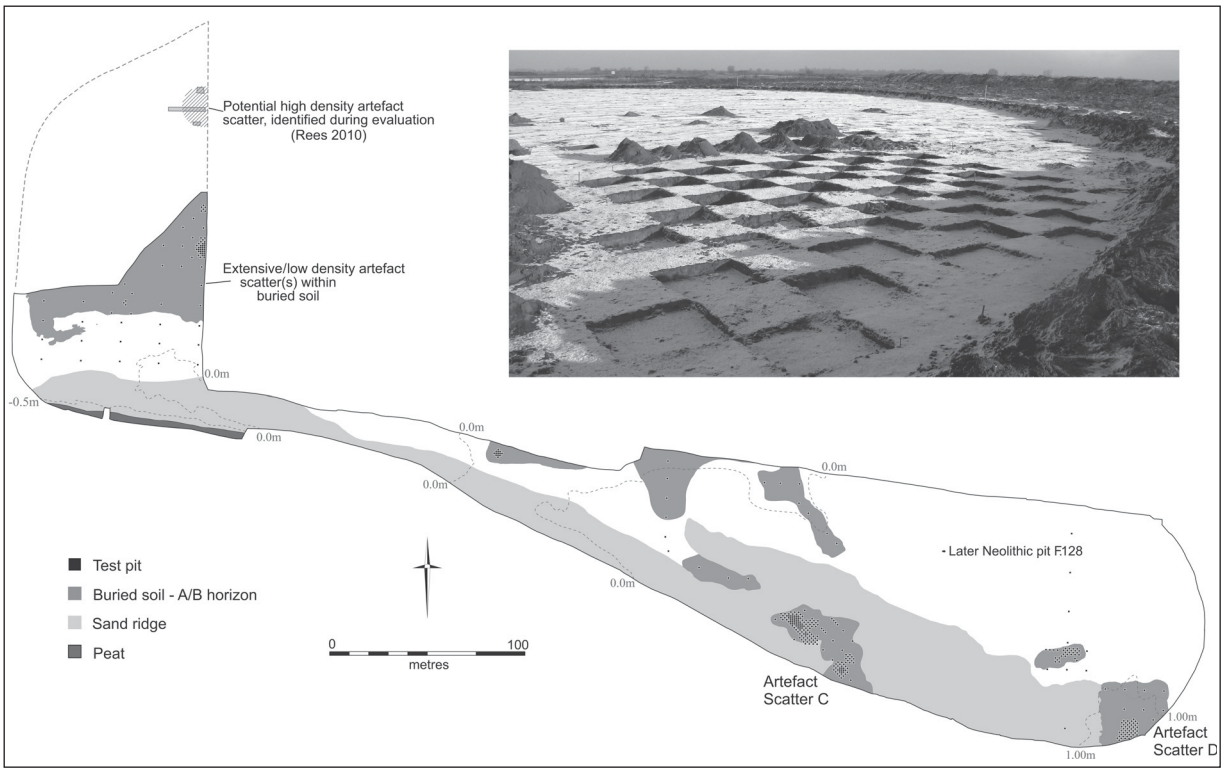

Figure 3. *Artefact scatters and buried soil horizons.*

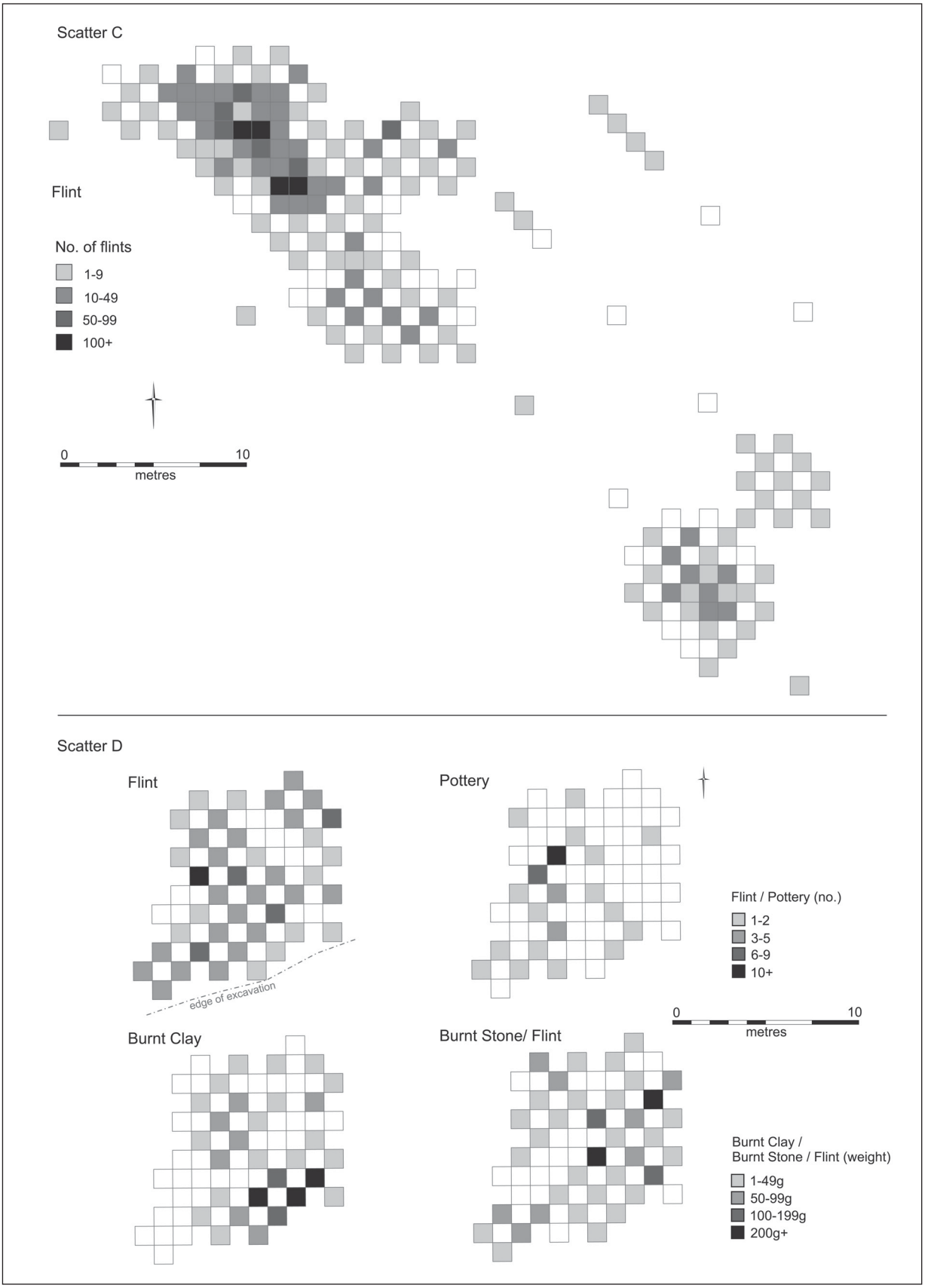

Figure 4. *Artefact scatter distribution plots.*

Later Neolithic activity (late 4th to 3rd millemium BC)

The later Neolithic evidence is dominated by an extensive flint scatter (Scatter C), the only other broadly contemporary feature being a single isolated pit (F.128), which contained a small later Neolithic flint assemblage (Fig. 4). Scatter C comprised two concentrations of artefacts, which together covered an area of *c.* 250 square metres; finds' densities ranged from 0 to 191 finds per m^2 (Fig. 4) The artefact assemblage was dominated by worked flint (2413 pieces; 3500g), of which the majority was later Neolithic; 492 (1774g) pieces of unworked burnt flint were also recovered. The scatter contained only small amounts of pottery (113 sherds; 267g) the majority of which was 'residual' Early Neolithic material, however, three sherds of Peterborough Ware could feasibly be contemporary with the later Neolithic flint assemblage.

A number of isolated pits and a possible hearth feature (represented by a patch of scorched ground surface) were found in the area of Scatter C, sealed beneath the buried soil, however, none can be confidently linked to the scatter due to a lack of dateable finds, and it is equally likely that they relate to Early Neolithic (see Tabor forthcoming) or Early Bronze Age activity to the west.

***Beaker period activity* (c. 2400-1900 BC)**

A discrete artefact scatter (Scatter D) recorded in the south-east of the site – and extending beyond the edge of excavation to the south and east – dates to the Beaker period. The spread of material measured *c.* m by 10m with artefacts present at a density of up to 49 finds per m^2. The finds assemblage included comparatively large amounts of burnt material – highly fired clay (206 fragments; 1921g) and burnt flint/stone (118 fragments; 528g) – as well as 142 worked flints (414g) and smaller amounts of Beaker pottery (43 sherds; 236g) and calcined animal bone not identifiable to species (19 fragments; 236g). Of particular note is the evidence of moulding and wattle imprints present on many of the fired clay/daub fragments suggesting they derive from a structure of some kind (see Timberlake, below). Few clear patterns emerge from the test pit find distribution plots (Fig. 4) – the numbers of flint and pottery sherds particularly being rather too low to provide meaningful distributions – however, there does appear to have been a concentration of burnt clay in the east and south of the scatter. No sub-surface features could be clearly associated with the spread although a possible pit/tree throw containing residual burnt flint/stone and clay from the surrounding soil was recorded.

Surface finds across the remainder of the site, the location of which largely coincided with areas of well-preserved buried soil, appear to equate to general background levels of activity although a second 'low density' scatter was recorded in the north-west of the site. Here, Beaker sherds and worked flint – including 72 small abraded sherds from a single vessel recovered from two test pits – may represent the edge of an occupation site to the north, beyond the edge of excavation. This would correspond with an area of high buried soil finds' densities identified in evaluation trenches and not subsequently included within the quarry extension area (Rees 2010; see Fig. 3).

Three pits can also be securely attributed to the Beaker period. Pits F.148 and F.149 occurred as a pair *c.* 100m to the north-west of Scatter D, while pit F.35 was a relatively isolated feature in the west of the excavation area (see Fig. 5). All of the pits were relatively small (maximum 0.64m wide by 0.31m deep) and produced finds including Beaker pottery sherds. Pit F.149 was most notable for its assemblage of 94 sherds of Beaker pottery representing at least four vessels, with both rusticated and finer forms present. It also yielded quantities of charred hazelnut shells along with smaller amounts of charred cereal grains as well as a partially perforated stone implement/pebble of unknown function (Timberlake in Tabor 2011). A fragment of charred hazelnut from F.149 submitted for radiocarbon dating produced a date of 2029–1880 cal BC (SUERC-41459, 95% probability; see Table 1). Pit F.35 produced comparatively high quantities of burnt flint and was the only Beaker feature containing animal bone (small calcined fragments not identifiable to species).

***Early Bronze Age activity* (c. 2100-1500 BC)**

In contrast to the Neolithic and Beaker periods, little trace of activity that can be clearly attributed to the Collared Urn-associated Early Bronze Age was present within the buried soils. Instead, the evidence comprised two ring-ditches in the eastern half of the excavation area and a series of 'pit-wells' and watering holes (Fig. 5).

Of the five pit-wells recorded; four contained Collared Urn (or associated) pottery (F.125, F.154, F.156 and F.172) with a fifth (F.165) assigned to this

Table 1. *Radiocarbon measurements of materials from selected Beaker/Early Bronze Age features (calibrated using the IntCal09 curve).*

Feature	Material	Laboratory code	$\delta^{13}C$ (0/00)	Radiocarbon age (BP)	Calibrated date (95% confidence)
F.44	Carbonised pot residue	SUERC-41463	-27.8	3400 +/- 30	1771–1617 BC
F.108	Waterlogged wood	SUERC-41449	-25.1	3500 +/- 30	1906–1743 BC
F.125	Charred grain (*H. vulgare* L.)	SUERC-41458	-25.3	3495 +/- 30	1900–1740 BC
F.149	Charred hazelnut shell	SUERC-41459	-23.8	3585 +/- 30	2029–1880 BC

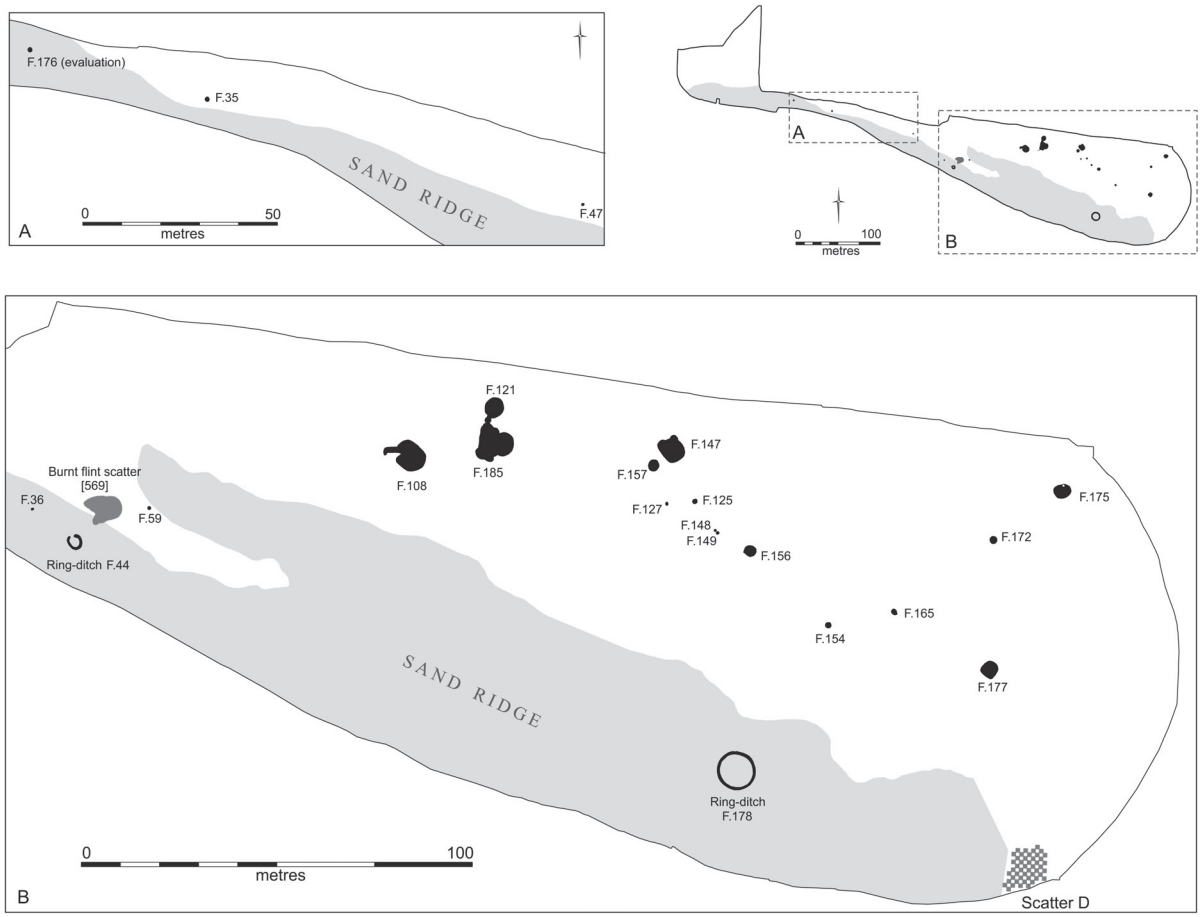

Figure 5. *Early Bronze Age features.*

feature group as a result of its size and form. Each pit-well had a characteristic water-eroded profile – steep sides, undercutting towards the base – with a sequence of fills comprising sandy silts and 'slumped' sand/gravel deposits. Plant macro-remains from environmental bulk samples from pits F.125, F.154 and F.156 indicate that the bases of the features, while 'open', were certainly wet and muddy and may well have held water on a permanent basis (see Fryer, below).

F.125: Sub-circular pit (diameter: 1.02m, depth: 0.8m). Contained eight fills including a primary deposit comprising a peaty fill with frequent fragments of burnt and unburnt wood, which produced four sherds of Collared Urn pottery, and small quantities of worked flint, animal bone and burnt stone. In addition a fragment of worked bone, possibly part of a bone point or gouge (Rajkovača in Tabor 2011), and a fragment of worked (and subsequently burnt) stone, which had been perforated (Timberlake in Tabor 2011), were also recovered.

F.154: Sub-circular pit (diameter: 1.5m, depth: 0.8m). Yielded a small quantity of animal bone and a near-complete accessory vessel or cup found close to the base of the pit. The vessel is crudely made and of a type commonly found in association with Collared Urn burial contexts.

F.156: Sub-circular pit (diameter: 3m, depth: 1.15m). Contained a complex sequence of 24 fills including a rich 'midden-like' deposit close to the top. Finds from this fill included Collared Urn pottery (eight sherds; 75g), worked flint and a comparatively large amount of animal bone, while the heavily degraded remains of a timber/plank – perhaps formerly a means of access – were recorded in the base of the pit (Bamforth in Tabor 2011).

F.165: Sub-circular pit (diameter: 1.3m, depth: 0.7m). Yielded only two finds; a worked flint and a fragment of burnt stone.

F.172: Sub-circular pit (diameter: 1.65m, depth: 0.85m). Produced a single sherd of Collared Urn pottery along with an assemblage of animal bone largely comprising 12 cow ribs, which although not articulated seem likely to have come from the same animal.

The pit-wells moderately-sized finds assemblages appear likely to derive from surface deposits and soils in the immediate vicinity of the features. As such the variability in the size and nature of the assemblages probably reflects the pits' proximity to contemporary settlement. The 'domestic' character of the assemblages recovered from pits F.125 and F.156 – located 17m apart – potentially, therefore, represents a nearby oc-

cupation site, with the remaining pits located to the south-west slightly removed from contemporary occupation.

In relative close proximity to the pit-wells and together forming a broad east-west swathe, six large pits have been identified as watering holes (Table 2). A number of the pits bore a striking resemblance to the Early Bronze Age watering hole recorded immediately to the north of the site during Oxford Archaeology's 2004/2005 excavations (Webley and Hiller 2009). All had a maximum depth of around one metre, with at least one side of the pit being relatively shallow, presumably to allow access and egress. All contained a sequence of fills comprising interleaving layers of silty sand and silty gravels together with slumped deposits, capped by a desiccated peat deposit. Three of the watering holes showed evidence of 're-cutting' following episodes of slumping/collapse.

The watering holes contained few finds, indeed F.157 and F.175 contained none at all, and the majority of artefacts – certainly the worked flint and one abraded sherd of Neolithic pottery – appear to have been incidentally incorporated into the features. Whilst this means that the finds cannot be used to accurately date the features, the high proportion of Early Bronze Age flint – added to the fact that no remains post-dating the Early Bronze Age were recorded on site – suggests that the watering holes date broadly to this period. Other notable finds comprise the proximal half of a human tibia, which was recovered from F.147 (see Dodwell in Tabor 2011) and a number of preserved pieces of roundwood from F.108. Of these, two were trimmed/worked, with one substantial forked piece probably representing a felled tree; all the wood appears to have been purposefully deposited or cleared into the watering hole (Bamforth in Tabor 2011). Radiocarbon-dating of the felled tree produced a calibrated date range of 1906–1743 cal BC (SUERC-41449, 95% probability; see Table 1) all but confirming the features' Early Bronze Age origin.

One other watering hole/well also appears likely to belong to the Early Bronze Age although no dating evidence was recovered from its sterile fills. The steep sided shaft-like feature (F.177) was different in character to both the Collared Urn associated pit-wells and the watering holes and measured 3.7m in diameter by 1.92m deep.

A further four small pits (F.36, F.47, F.59 and F.127), more comparable to the earlier Neolithic and Beaker pit forms, all produced minor amounts of pottery, broadly dated to the Early Bronze Age based on fabric. Of these, pit F.127 was located close to the possible occupation site represented by Collared Urn pits F.125 and F.156 and seems likely to be associated, while two of the pits (F.36 and F.59) were close to 'ring-ditch' F.44 and a surface spread of burnt stone and flint ([569]).

Generically labelled as 'ring-ditches', a penannular gully (F.44; Fig. 6) and a ring-gully (F.178) were located in the eastern half of the excavation area.

Penannular gully F.44 (0.07-0.27m wide by 0.32-0.74m deep) was irregular in form and defined an area 3m in diameter, with a north-west facing 'entrance' or causeway. A single greyish silty sand fill with moderate charcoal inclusions yielded a finds assemblage comprising pottery sherds, flint and burnt flint. The pottery was all Early Bronze Age in date and included re-fitting sherds of part of the rim of a Collared Urn vessel, which appeared to be *in situ*. The rim had been truncated by ploughing and it is possibly the remnants of a complete inverted vessel placed within the gully. The worked flint was predominantly made up of waste flakes although a small sub-circular scraper was also recovered.

Ring gully F.178 had an internal diameter of *c*. 8.5m, and was more regular in form than F.44, being relatively circular in plan and with a U-shaped profile (0.35–0.62m wide by 0.13–0.24m deep) The gully fills produced a limited finds assemblage comprising worked flint, burnt flint, burnt stone and pot sherds as well as a few small fragments of calcined animal bone. While the flint is not chronologically diagnostic, the pottery has been identified as Early Neolithic and is almost certainly residual material. Indeed, given the nature of the gully fills, there is a good chance that most of the finds recovered are residual and reflect former activity in the vicinity rather than relating directly to the ring-gully.

Penannular gully F.44 can be securely dated to the Early Bronze Age having yielded sherds of Collared Urn pottery, one of which had a carbonised residue adhered to it producing a radiocarbon date of 1771-1617 cal BC (SUERC-41463, 95% probability; see Table 1). Ring-gully F.178 has also been assigned an Early Bronze Age date, although given the apparently residual nature of all of its dateable finds – which also ruled out any radiocarbon-dating possibilities – this must be based solely on its form and the fact that no prehistoric activity post-dating the Early Bronze Age was recorded on site. The fact that the location of F.178 appears to coincide with a gap in a post-medieval cultivation trench/ditch – suggesting it was 'visible' during this period – is however, problematic and whilst the relationship may be coincidental it does cast some

Table 2. *Watering holes, dimensions and finds assemblages.*

Feature No.	Length (m)	Width (m)	Depth (m)	No. of re-cuts	Finds
F.108	8.2	6.5	1.25	1	Animal bone, flint, worked wood
F.121	5.42	5.34	0.82	-	Animal bone, flint, pottery
F.147	5.95	5.45	0.98	2	Animal bone, human bone, flint,
F.157	2.75	2.6	0.8	-	None
F.175	4.29	3.44	0.83	-	None
F.185	9.8	9	1.12	8	Flint

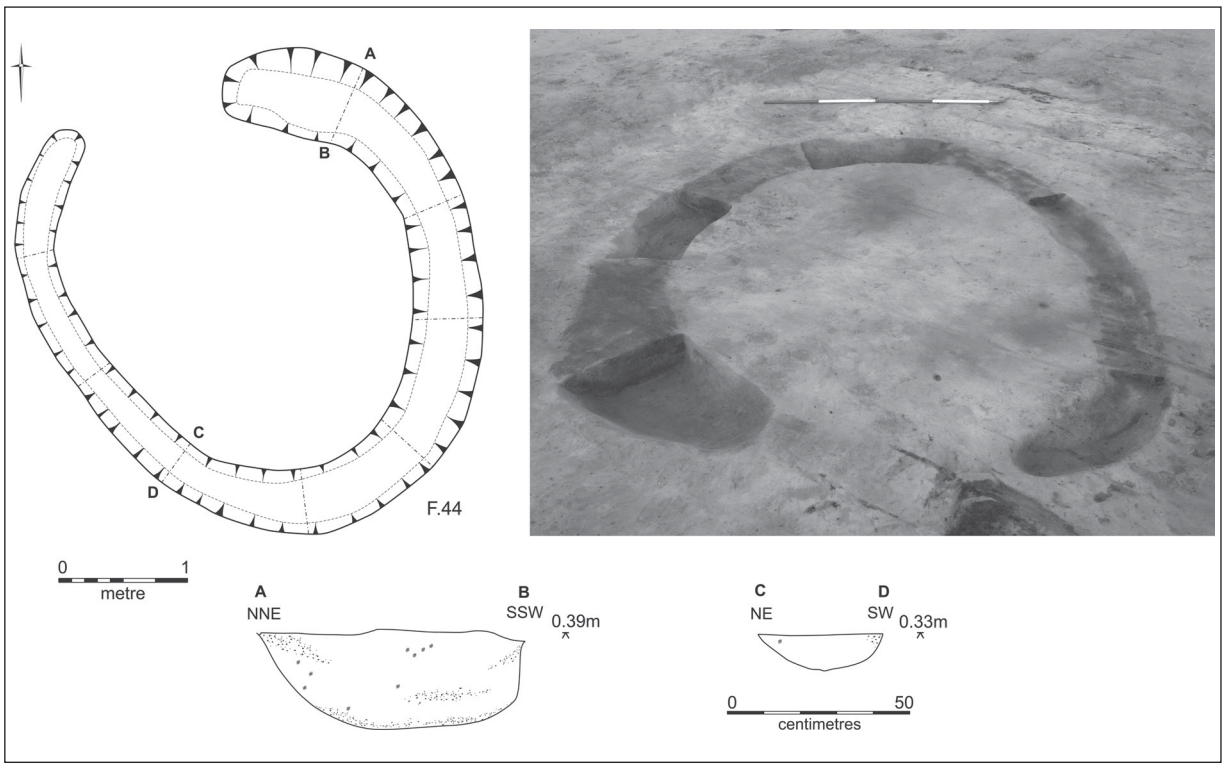

Figure 6. *Ring ditch F.44.*

doubt on F.178's prehistoric origin.

The two ring-ditches are somewhat enigmatic features, with no clear evidence as to their function. F.44, for example, with its internal diameter of no more than 3m, appears too small to have been a structure. Regional parallels are, however recorded at the Cat's Water site, Fengate (Pryor 2001 and Evans *et al.* 2009) and Rhee Lakeside South, Earith (Ring-Ditch 5; Evans *et al.* 2013); both associated with larger ring ditches, these 'mini-rings' are both now thought to be Early Bronze Age and considered likely to have been funerary-related. The presence of the rim of the possibly inverted *in situ* Collared Urn within the gully of F.44 – which clearly resonates with inverted cremation urns such as that found in the SUT 7 round barrow (Connor 2009) – suggests it may also be some sort of small funerary monument. In this sense the ring-ditch can also be compared to the un-ditched small primary mounds of the barrows recorded at the Low Grounds barrow cemetery at Over (Evans *et al.* forthcoming) and may represent a ditched variant of such 'proto' monuments. Aside from its slightly problematic dating, ring-gully F.178 can also be interpreted as a funerary monument although being slightly larger in size (*c.* 8.5m) that it could represent some kind of structure or even something as simple as a feature encircling a hay-rick (see also Evans *et al.* 2013, 128) cannot be ruled out.

Of course, the lack of any human remains – cremated or inhumed – does undermine both features' funerary-related attributions; however, recent excavations at Over (Evans *et al.* forthcoming) highlight the degree to which cremations were often placed upon the land surface – usually on top of *in situ* pyre remains – rather than buried. As such, given that F.44 and F.128 occupied the crest of the sand ridge in the south of the excavation area, which had effectively been 'capped' by modern ploughing, it is perfectly possible that either or both ring-ditches/gullies may once have enclosed a small mound sealing a cremation situated on the old ground surface.

Artefacts and economic evidence

Flint

Lawrence Billington

A total of 2740 worked flints were recovered from later Neolithic and Early Bronze Age contexts (Table 3). The flint is generally of good quality but varied in terms of colour and texture. Based on surviving cortical surfaces the vast majority appears to have been worked from small nodules of flint derived from secondary gravel sources, potentially fairly local to the site. The later Neolithic assemblage does, however include a minority of flint probably from a primary chalk source. The condition of the assemblage is generally good, reflecting its recovery from relatively undisturbed deposits of buried soil or from the fills of cut features. Alongside the flint were two struck stone flakes, both recovered from later Neolithic Scatter C. Only one retains a polished surface, however both

	Late Neolithic		Beaker/Early Bronze Age														
	Pit	Scatter	Ring ditches		Watering holes				EBA pits		Beaker pits			Collared Urn pits			Scatter
Feature/Scatter no.	**F.128**	**C**	**F.44**	**F.178**	**F.108**	**F.121**	**F.131**	**F.147**	**F.59**	**F.127**	**F.35**	**F.148**	**F.149**	**F.125**	**F.156**	**F.172**	**D**
chip (<10mm)	11	985	10	18		4	1	1					3		14		26
irregular waste		50	1	1									1	1	1		10
flake <20mm	4	590	3	3	1			4			1			3			35
flake >20mm	9	562	10	7	3	3		1	3	1		2	2	5	11		48
narrow flake		64			1				1						1		3
blade like flake	3	61		1													5
blade		17	2	1													2
bladelet		21	1														3
flake from stone impl.		2															
rejuvenation flake		4						1									
janus flake		4															
irregular core															2		
single plat. flake core															1		
two platform flake core		1													1		
multiple plat. flake core		3	1														2
discoidal core		1															
core fragment		3													1		
minimally worked core						1		1									
end scraper		9			2										1	1	1
sub circular scraper			1		1												
thumbnail scraper		1															2
other scraper		2												1	1		6
microlith		4															
fabricator		2															
invasively retouch. knife															2		
piercer				1													
chisel arrowhead	1	5															
B and T arrowhead																	1
arrowhead fragment		1															
misc retouched		17							1				1	1	1		3
serrate		4															
notched																	1
Total worked	**28**	**2413**	**29**	**32**	**8**	**8**	**1**	**8**	**5**	**1**	**1**	**2**	**7**	**11**	**37**	**1**	**148**

Table 3. *Later Neolithic and Early Bronze Age worked flint (B and T = Barbed and Tanged).*

are likely to have been struck from polished stone axes and the stone, although only macroscopically examined, appears to be of Langdale tuff (Group VI), with an origin in Cumbria (see Bradley and Edmonds 1993).

Later Neolithic

A total of 2441 worked flints were recovered from later Neolithic contexts. This includes a small assemblage of 28 flints, including a chisel arrowhead, from pit F.128 and a large assemblage (2413 flints) from buried soil Scatter C. The scatter is overwhelmingly dominated by flintwork of later Neolithic date characterised by diagnostic forms such as chisel arrowheads and evidence for the use of Levallois-like core reduction techniques (Ballin 2011a and 2011b). These technologies, together with the manufacture of transverse arrowheads, appear to have developed in the later fourth millennium BC, when they are associated with Peterborough Ware pottery, and continue into the earlier third millennium BC, by which time they are associated with Grooved Ware pottery. The definition of the later Neolithic used here is based on lithic technology and typology (following Ballin 2011b), rather than pottery styles, which have recently tended to incorporate Peterborough Ware into the earlier Neolithic, or to associate them with a distinctive Middle Neolithic. The assemblage also contains a small proportion of earlier flintwork including a small Mesolithic component, seen most clearly in the presence of four microliths, two narrow obliquely blunted pieces, a scalene triangle and an unclassified fragment.

Although all stages of reduction are represented in the assemblage it is notable that cores are very poorly represented, with 86 removals over 20mm in size for every core. It is also likely that many of the finer removals suitable for use as tool blanks have been removed from the assemblage. Conversely it is possible that some partially worked cores were brought to the site as there are relatively few large decortication flakes when compared with the size of some of the non-cortical removals. The refitting potential of the assemblage was low and although there were many flints which appeared to derive from the same nodules of raw material no refits could be made. A single break refit was made on a fabricator, the two halves of which were found in test pits 9m apart.

Technologically the assemblage is dominated by flake-based reduction strategies, some of which appears to derive from simple core reduction strategies producing flakes of varied morphology but often relatively broad and thick. These pieces rarely show any evidence for platform preparation and were removed by direct hard hammer percussion. All of the cores appear to derive from these relatively simple reduction strategies although as they are invariably exhausted and small (average weight 17g) they may represent the much reduced remnants of previously more elaborate core types. Alongside this generalised flake production is abundant evidence for more sophisticated Levallois-like and discoidal core reduction techniques. Levallois-like cores have traditionally been explicitly linked to the production of transverse arrowheads (e.g. Green 1980), but it is clear that Levallois-like blanks were also used for a wide range of tools including knives and scrapers (e.g. Manby 1974, Ballin 2011b). In the absence of Levallois-like or discoidal cores and the lack of refitting material in the assemblage it is difficult to reconstruct the precise nature of the Levallois-like/discoidal technology used at the site (c.f. Ballin 2011a). A total of 140 removals have been identified as deriving from discoidal/keeled or Levallois-like cores. Several of these flakes are classic, preferential Levallois removals (e.g. Fig. 7, 1). These fine relatively large and thin flakes invariably bear carefully faceted striking platforms and complex dorsal scar patterns. Also present are ten distinctive flakes (*éclat plus large que long*) and several half-crested pieces (*éclat débordant*) that have been recognised in the experimental working of discoidal and Levallois type cores (Boëda 1993 and 1994).

Another distinctive characteristic of the assemblage is the intentional breakage of flakes, which is evident on thirteen pieces as evidenced by distinctive break attributes including wedge-shaped fracture lines, and pronounced lips and impact marks on breaks (Bergman *et al.* 1987). Thirteen pieces with clear evidence of intentional breakage were recorded in the assemblage. The majority of these (ten pieces) are the proximal ends of fine Levallois-like flakes and probably represent the by-product of transverse arrowhead production, whereby the proximal end of a flake was removed and the remaining distal portion was shaped by retouch (Fig 7.3). The absence of these corresponding distal portions of flakes suggests these were further modified and probably removed from the site. This method of arrowhead production has been recently recognised at Late Neolithic sites on the western Fen edge (Beadsmoore 2009) and in the Thames Valley (Anderson-Whymark 2011).

Although the proportion of retouched tools in the later Neolithic assemblage is very low (1.9%), the 45 retouched pieces include a wide range of characteristically later Neolithic forms of which scrapers were most common (twelve pieces). A general distinction can be made between the majority of scrapers which are carefully made, often relatively large, convex end scrapers and other more expediently produced pieces. The finer scrapers are made on both cortical and non-cortical flakes but are all characterised by fine convex retouch and generally symmetrical morphologies (Fig. 7, 2 and 5). The vast majority are complete, although a single fine end scraper from TP 117 may have an intentionally broken proximal end. Five complete or near complete arrowheads and a probable arrowhead fragment are present. The five classifiable arrowheads are all of chisel type; four can be classified as Clark's type C (e.g. Fig. 7, 8; Clark 1934) whilst the fifth is of an unusual T-shaped or hammerhead form (Fig. 7, 7). The dorsal scar pattern and morphology of several of the arrowheads suggests they were made on Levallois-like blanks. Two fabricators, one consisting of two refitting pieces (Fig. 7, 6) are

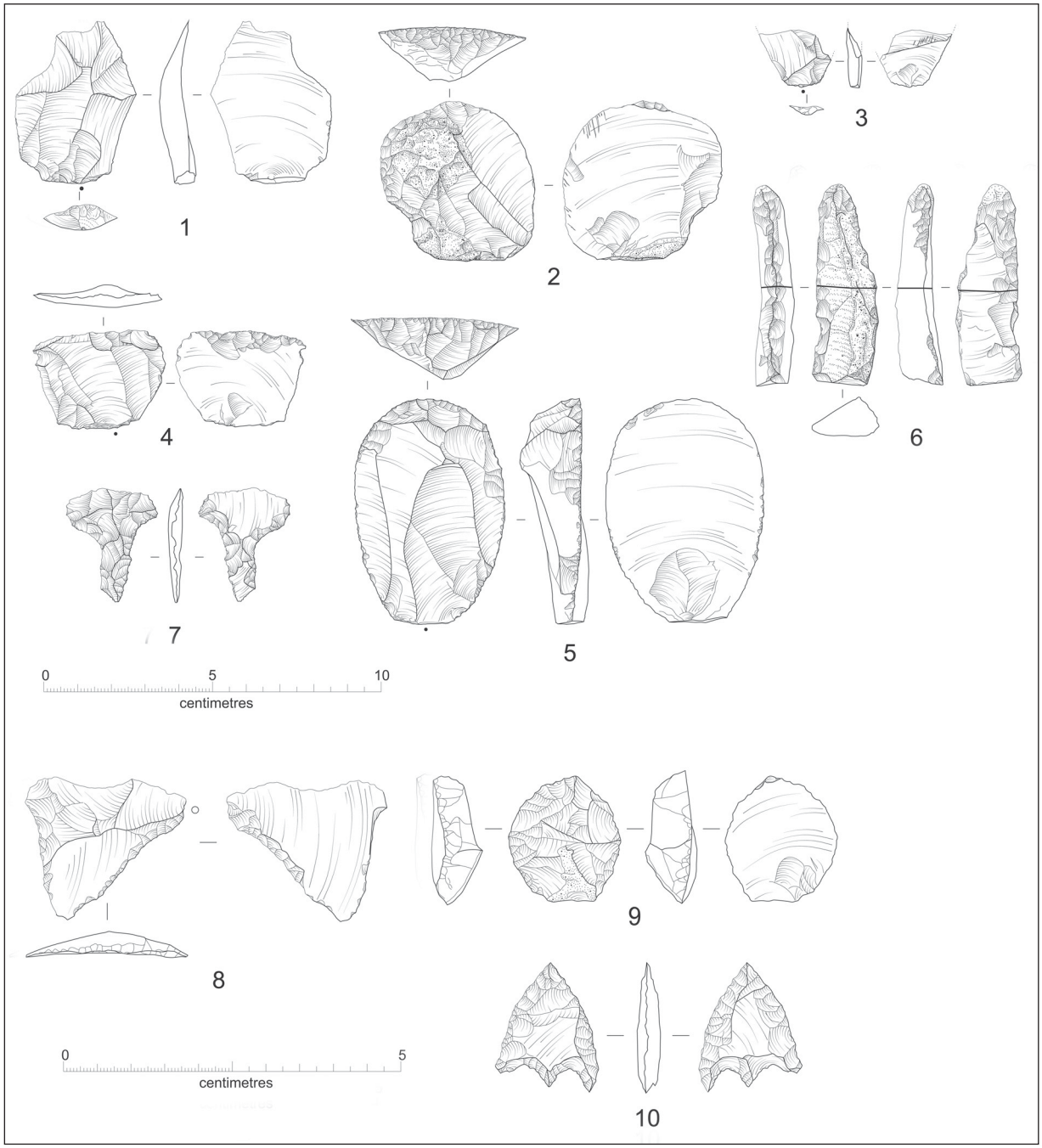

Figure 7. *Flint from Scatters C and D.*

present. Both are elongated pieces which have been extensively flaked and bear characteristic abrasion/polish at one end. Although their function remains somewhat enigmatic the distinctive wear patterns on these pieces are often interpreted as resulting from use as strike-a-lights (Edmonds 1995: 41). Four serrated pieces are also present; all are made on relatively elongated or blade like flakes and have a single serrated lateral edge.

Finally, the largest category of retouched tools were recorded as miscellaneously retouched (17 pieces). The majority (13 pieces) are flakes with minimal retouch, edge trimming or small areas of invasive retouch, which presumably functioned as cutting tools. Many of these are made on elongated flakes and at least two are made on Levallois-like blanks, including one flake resembling an *éclat plus large que long* with bifacial retouch at its distal end (Fig. 7, 4). Also included in this broad category is a possible chisel arrowhead blank; a medial segment of a broad thin flake with light edge trimming or heavy utilisation on its margins, which may represent abrasion to prepare the piece for pressure flaking.

Beaker/Early Bronze Age

A total of 299 worked flints were recovered from Beaker and Early Bronze Age contexts (Table 3). Almost half of these flints were recovered from buried soil Scatter D. The remainder of the assemblage derived from cut features including pits, watering holes and two ring ditch features.

Scatter D

A total of 148 worked flints were recovered. A relatively large quantity of unworked burnt flint weighing a total of 503g was also recovered and it is notable that a high proportion of the worked flint, 27%, has been burnt. Although the assemblage contains a small number of blade-based products of Mesolithic or earlier Neolithic date the vast majority is technologically coherent and is closely comparable to the Early Bronze Age flintwork recovered from the pit features on the site. Also present are a number of classically Early Bronze Age retouched tools including a barbed and tanged arrowhead and thumbnail scrapers.

The unretouched element of the assemblage consists of flake-based material which is the product of a relatively unstructured and casual approach to reduction. The use of hard hammer percussion is ubiquitous and striking platforms are generally plain (70%) or cortical (10%) with a very low incidence of preparation in the form of dorsal trimming. The morphology of the flake removals tend towards squat and thick forms with irregular margins and almost a quarter of the flakes bear flake scars indicating the use of multiple platform cores. Two cores were recovered, both were multiple platform cores that had been extensively reduced and exhausted.

Retouched tools are well represented in the assemblage (14 pieces; 8.8%). There was a clear distinction between somewhat irregular, expediently produced examples and finer scrapers, often with invasive or semi-invasive retouch and including two classic thumbnail scrapers (Fig. 7, 9). Three edge retouched flakes and a notched flake were also recovered. A single arrowhead, of barbed and tanged form is also present (Fig. 7, 10). It is a complete, small example of Green's Sutton C type (Green 1980).

Pits

A total of 65 flints were recovered from seven pits. The assemblages were generally very small; only two pits contained more than five worked flints and almost half of the pit assemblage as a whole was recovered from one relatively rich feature, pit F.156. The material is dominated by unretouched flake based waste from all stages of core reduction. Technologically this material represents a relatively expedient and unstructured approach to core reduction; hard hammer percussion appears to have been used exclusively and there is little evidence for platform preparation. Dorsal scar patterns indicate the use of irregular cores with multiple striking platforms and the morphology of removals is varied, with a tendency for flakes to be relatively broad and thick. Five cores were recovered from the pits, all from F.156. One is an exhausted flake core with two striking platforms whilst the remainder are more irregular and much less intensively worked. Considering the small size of the pit assemblages retouched tools are well represented, making up 15.4% of the worked flint. Four scrapers were recovered. A single expediently produced irregular scraper was recovered from Collared Urn pit F.125. Two fine convex end scrapers with fine semi-invasive to invasive retouch were found in Collared Urn pits F.172 and F.156, the latter feature also contained a scraper manufactured on a natural 'pot-lid' fractured flake. Two invasively retouched flakes, classified here as flake knives were recovered from F.156, both were broken and one had been heavily burnt. The remaining retouched tools consist of flakes with informal and generally ad hoc retouch.

Watering holes

A total 25 worked flints were recovered from four watering holes. The small size of the assemblages from individual contexts and the clear mix of flintwork of different periods suggests the majority if not all has been inadvertently incorporated into the features and derives from surface scatters in the buried soil. Clearly residual pieces include a fine Mesolithic core tablet and a classic later Neolithic Levallois-like flake. Much of the flintwork consists of flake-based waste and tools probably of late Neolithic or Early Bronze Age date. Some of this is likely to be broadly contemporary with the use of the waterholes particularly distinctive Early Bronze Age forms such as a fine invasively retouched thumbnail scraper from F.108.

Ring-ditches

Penannular gully F.44 produced a small assemblage of 29 worked flints which is broadly comparable with the material from the Collared Urn pits and from Scatter D. Small hard hammer struck waste flakes predominate and a single small multiplatform flake core was recovered. A neat sub-circular scraper is the only tool in the assemblage. There is little clearly residual material and much of the flintwork is likely to be contemporary with the feature. In contrast the assemblage recovered from ring ditch F.178 (32 worked flints) is very disparate in terms of raw material and is clearly chronologically mixed with several probable earlier Neolithic blade-based pieces present, including the only retouched tool, a piercer.

The later Neolithic and Beaker/Early Bronze Age flintwork from Sutton Gault is, in general terms, typical of assemblages from the wider region sharing familiar and distinctive technologies and tool forms which are best documented in assemblages from pit sites (Garrow 2006). The most important elements of the assemblage therefore are those that derive from discrete scatters within the buried soil, which furthermore appear to represent individual episodes of activity as opposed to the more familiar mixed, multi period palimpsests that make up most lithic scatters in the region (see Edmonds *et al.* 1999).

The Scatter C assemblage clearly represents a range of activities, including intensive flint-working, but also the use of a relatively wide range of tools. In contrast with the earlier Neolithic assemblages (Billington in Tabor forthcoming) a relatively large amount of unworked burnt flint was recovered from the scatter and whilst the purpose of heating flint remains a matter of speculation (see e.g. Edmonds 1999), this perhaps also attests to a relatively broad range of activity. It could be argued therefore that the overall size of the assemblage, the wide range of tools and the burnt flint may be suggestive of 'domestic'/'settlement' type activity. However, the absence of pottery, cut features and the incomplete-

ness of the reduction sequences (which suggest the transport of cores, blanks and tools to and from the site) distinguishes the assemblage from more 'typical' assemblages recovered from pit sites in the region. The somewhat unusual character of the assemblage is also reflected in the composition of the retouched component of the assemblage, which contains a high proportion of arrowheads compared with other "published" later Neolithic sites in the region (e.g. Beadsmoore 2009, Healy 1993, Pryor 1978). Complementing this is the evidence for probable arrowhead manufacture, evinced by the presence of deliberately broken proximal ends of fine Levallois-like blanks. The importance of arrowheads in the assemblage might suggest an emphasis on hunting, especially in light of the often relatively high proportion of wild species in some other later Neolithic faunal assemblages from the region (see Evans *et al*. 2009, 11–112), although the probable role of arrowheads in inter-personal violence should not be overlooked (Edmonds and Thomas 1987).

Whilst it seems probable that the later Neolithic flintwork represents a rather specialised activity potentially distinct from that represented at contemporary pit sites, the high proportions and range of retouched tools within the Beaker and Early Bronze Age assemblages and their association with pottery and other artefacts readily suggests these assemblages represent the residues of a variety of settlement-related activities. Importantly this appears to apply equally to the assemblages from cut features and from Scatter D and there are no clear indications of variability between these contexts which could be attributed to differences in the longevity or function of individual episodes of occupation.

Prehistoric pottery
Mark Knight

The later Neolithic and Early Bronze Age pottery assemblage comprised 323 sherds weighing 1812g (Mean Sherd Weight (MSW) 5.6g; Table 4). The bulk of the material came from features (74.5% by weight), although buried soil test pits (18.5%) and surface finds (7.1%) also produced small amounts. In general, potsherds recovered from features were larger and less abraded/weathered than those from test pits or the surface. The fabric series was restricted and frequently showed only subtle variations between types. Grog-tempered fabrics predominated and as a consequence the main diagnostic factors were differences in forms and decoration techniques. Feature sherds included 13 rims, seven base fragments and 113 decorated pieces.

Beaker pottery made up the majority of the assemblage (67.1% by weight and 72.8% by number). The second largest component was Collared Urn (30.0% by weight and 21.7% by number) followed by small amounts of plain 'unidentified' Early Bronze Age pottery and Peterborough Ware.

	Number	**Weight, g**	**MSW, g**
Peterborough Ware	5	14	2.8
Beaker	235	1215	5.2
Collared Urn	70	543	7.8
Unidentified Early Bronze Age	13	40	3.1
Total	**323**	**1812**	

Table 4. *Assemblage Composition. MSW= Mean sherd weight*

Peterborough Ware
Four sherds including two refitting rim sherds decorated with an impressed herring-bone design from a single buried soil test pit represent possible fragments of Peterborough Ware. In addition one further test pit contained a sherd of similar fabric (medium hard with common small flint).

Beaker
Most of the Beaker collection was feature-based (136 sherds, weighing 956g) and the majority of this material came from a pair of closely-spaced pits F.148 and F.149 (99 sherds; 876g). A further eight features bore another 37 sherds (80g). In addition, buried soil contexts produced 99 sherds (259g) with the greater part being recovered from test pits (96 sherds; 239g). Adjacent test pits, TP 74 and TP 108, in the north-west of the site, generated 72 sherds (126g) belonging to a single vessel (Fig. 8, 7).

Paired pits F.148 and F.149 produced contrasting assemblages both in terms of size and composition. Pit F.148 held five sherds of which four refitted to make the rim/uppermost profile of a thin-walled, medium-sized 'collared' Beaker (Fig. 8, 1). The rim was tapered and the vessel was decorated with panels of short dashed lines above and below the vestigial collar or ridge. The fifth sherd was a base fragment possibly from the same vessel. Pit F.149 held 94 sherds comprising fragments of at least five different Beakers, including one highly plastic rusticated form with fingertip impressions (Fig. 8, 2), an incised vessel with dot-filled triangles separated by parallel lines (Fig. 8, 3), body sherds with an impressed herring-bone design (Fig. 8, 4) and a base and lower profile of a form decorated with incised crosses (Fig. 8, 5). An internally bevelled rim embellished with rows of short stabs (Fig.8, 6) completed the assemblage. All of the forms were grog-tempered although the fabric of the coarser/rusticated types included small irregular voids and as a consequence was less compact than the fabric of the accompanying finewares.

Beaker sherds from other features included a single fragment decorated with parallel lines made with a fine-toothed comb, the flattened rim of a rusticated form, an incised thin-walled vessel (all from tree throws/natural hollows) and a residual piece decorated with small semi-circular stabs (from F.156). Conjoining potsherds from TP 74 and TP 108 belonged to a thin-walled vessel with a raised cordon or vestigial collar (Fig. 8.7) (Fig.10, 7). Its decoration consisted of horizontal rows of paired fingernail impressions. Otherwise, the test pit assemblage comprised all-over-comb sherds from individual test pits, and comb-zoned pieces and a rusticated sherd from Scatter D.

Collared Urn
As with the Beaker pottery much of the Collared Urn assemblage involved individual distinctive pieces (overhanging

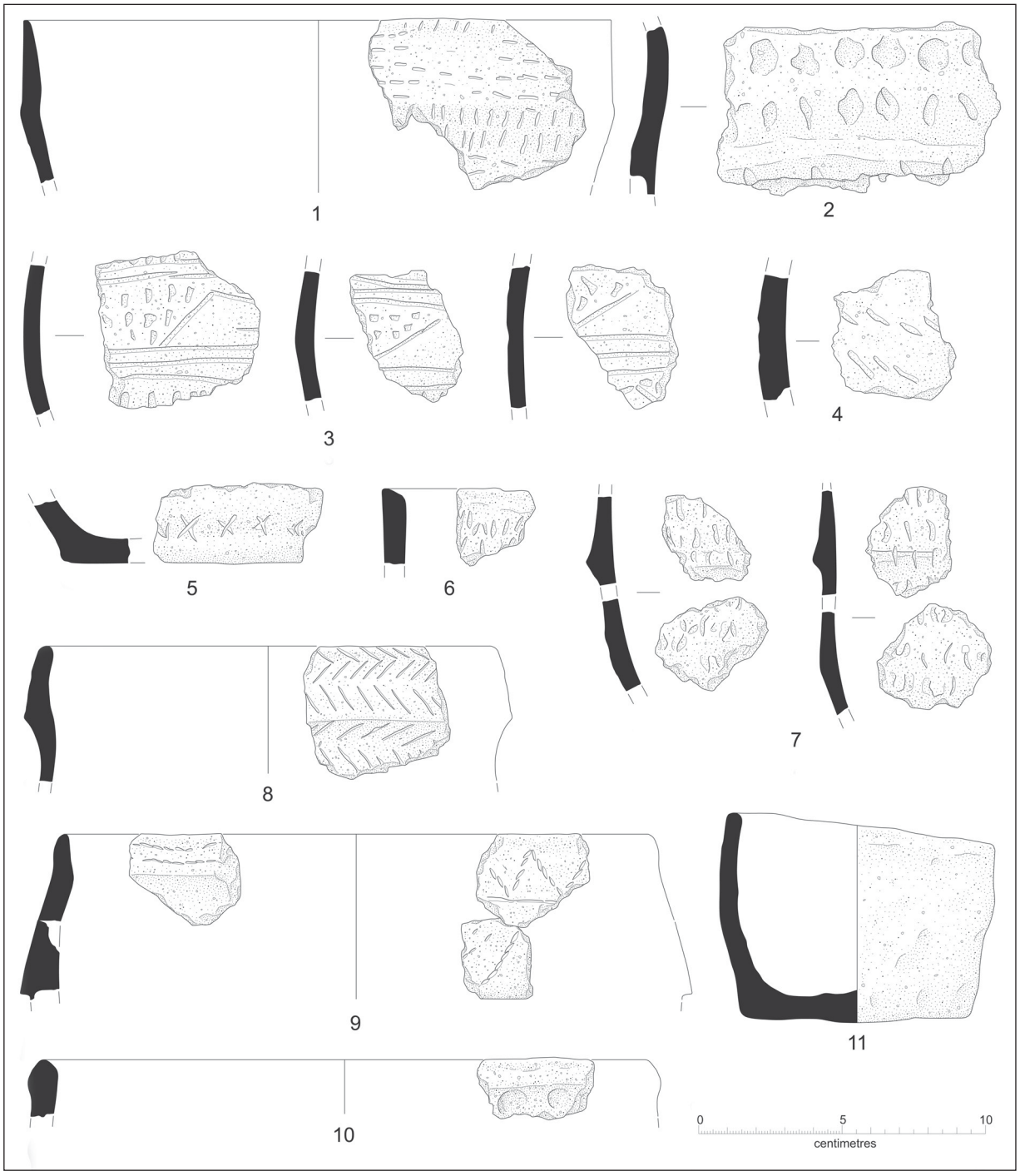

Figure 8. *Pottery from Beaker and Early Bronze Age features (Beaker, 1–7; Collared Urn, 8–11).*

collars, twisted-cord impressed decoration, heavy, internally bevelled rims) as opposed to large assemblages. In terms of quantity the main focus of Collared Urn deposition was related to a single pit, F.156 (nine sherds; 77g). The pit contained fragments of at least three different urns; rims/collars of two vessels (one decorated with incised herring-bone around the collar and the neck (Fig. 8, 8), the other adorned with twisted-cord triangles on the collar and a pair of twisted cord impressed lines inside the lip (Fig. 8, 9), which were located alongside a simple rounded rim decorated with fingertip dots (Fig. 8, 10).

A near-complete and crudely made accessory vessel or cup of a type found commonly in association with Collared Urn burial contexts (Longworth 1984) came from F.154 (Fig. 8, 11). This was straight sided and had a simple rounded rim. It measured 7cm tall and had a base and mouth diameter of about 9cm. The vessel had lost part of its rim, had been re-fired, and had the appearance of a roughly constructed finger-pot.

Four sherds from pit F.125 include a collar/shoulder fragment impressed with a twisted cord herring-bone pattern. Collared Urn fragments from buried soil test pits (seven

sherds; 46g) were less frequent than Beaker sherds and incorporated neck and collar pieces adorned with single or parallel lines of twisted cord. Surface finds (nine sherds; 108g) incorporated plain sherds as well as more rims/collars decorated with twisted cord and shoulders embellished with stabs, fingertip impressions.

The Peterborough Ware collection requires little discussion other than highlighting its similarity to the fragments of at least two vessels found at the adjacent North Fen investigations (Webley and Hiller 2009). The Beaker and Collared Urn assemblages represent significant groups especially in relation to other comparable groups situated along the lower reaches of the Great Ouse Valley. The Beaker assemblage is typical of domestic collections found throughout East Anglia (e.g. Bamford 1982, Gibson 1982, Healy 1996, Garrow 2006). The deposition of small, often abraded/weathered fragments representing the partial remains of multiple vessels would appear to be customary practice and analogous assemblages include the upstream examples of Haddenham (Pollard 2006) and the Over Lowlands investigations (e.g. Evans *et al*. forthcoming). Although comparatively small, the Collared Urn assemblage is also characteristic of an increasing corpus of domestic Collared Urn sites located in and around the Fenland Basin (Knight 2009). Within the context of the immediate landscape setting equivalent low density Collared Urn occupation-related material has likewise been recovered from the widespread Block Fen investigations to the north (Knight 2013). Correspondingly, higher up the Great Ouse Valley at Over and Barleycroft Farm large assemblages of 'domestic' Collared Urn have also been found (e.g. Evans *et al*. forthcoming).

Fired Clay
Simon Timberlake

Some 2.29 kg of burnt clay was recovered from the site, of which 1.92 kg came from a Beaker period buried soil (Scatter D), whilst a smaller amount was recovered from Early Bronze Age pits F.154 and F.156. Of most significance amongst the assemblage is the burnt clay/daub from Beaker period Scatter D, which contained the poorly preserved imprints of sticks (Fig. 9). The curvature of the largest of these impressions appear to represent small upright posts or stakes of at least 10cm diameter, possibly used in wall construction; the majority of the remainder measured 3–5cm or less, some of them clearly made by split wood. Some of the less weathered pieces of burnt clay (daub) would appear to represent lumps of clay pushed into the interstices between wattles; on some of these the angle of the stick joins could still be distinguished. One of the largest and best preserved lumps of burnt clay showed evidence of its moulding – in this case suggesting the presence of a square corner (to a doorway, sill or wall, Fig. 9, 4). A number of pieces of daub also appeared to have been moulded into balls or blocks and highly fired. In general the mixture of fire reddening (oxidation) and fire blackening (reduction) coloration on these clay fragments, and the range of degrees of firing from partial baking to severe fusing, implies that rather than being burnt *in situ*, the pieces of daub and wooden walling were broken prior to being burnt.

Faunal remains
Vida Rajkovača

A small animal bone assemblage (3383g) was recovered from the site. Of 32 small fragments recovered from later Neolithic and Beaker contexts – largely buried soil scatters – only four were identifiable to species; all were either loose cow teeth or enamel fragments. Amongst the 67 identified specimens from Collared Urn/Early Bronze Age features, 38 were identifiable to species (Table 5). Pit F.156 contained an interesting deposit of three pig mandibles all of which were of different ages at death (4–6 months, 7–14 months and 17–21 months) as well as a cow mandible (age at death, 6–8 months). Pit F.172 contained part of a cow axial skeleton comprising twelve cow ribs although not in articulation. As such they are quantified as 12 different specimens, albeit it is most likely that these were part of the same animal. Butchery – bone splitting for marrow removal – was noted on three specimens in the F.172 assemblage.

Taxon	NISP	MNI
Cow	22	2
Sheep/Goat	11	2
Sheep	1	1
Pig	4	4
Cattle-sized	9	-
Sheep-sized	20	-
Total	67	9

Table 5. *Number of Identified Specimens (NISP) and Minimum Number of Individuals (MNI) from Collared Urn/Early Bronze Age features.*

Plant remains
Val Fryer

A total of 19 samples from Beaker/Early Bronze Age features were analysed. Cereal grains and seeds of common weeds, wetland/aquatic plants and tree/shrub species were recorded, mostly at a low to moderate density, within all but three of the assemblages studied. Preservation was generally quite good, although a number of the charred cereal grains were fragmentary and puffed and distorted, with the latter possibly occurring as a result of combustion at very high temperatures. A full breakdown of the feature assemblages is provided in Tabor 2011.

Both barley (*Hordeum* sp.) and wheat (*Triticum* sp.) grains were recorded, along with a number of other cereals, which were too poorly preserved for close identification. With the exception of one partly charred or 'scorched' grain all ce-

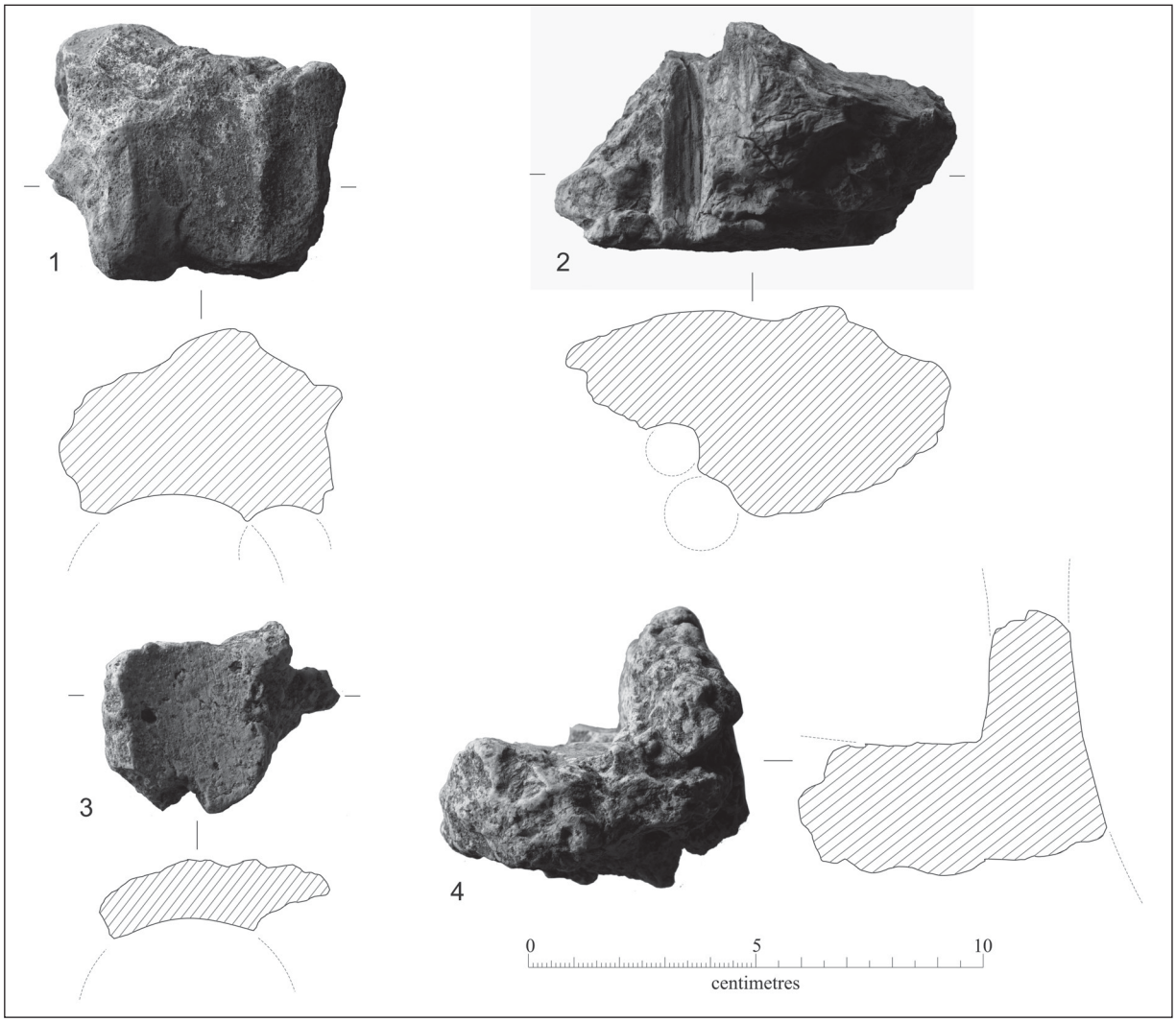

Figure 9. *Burnt clay/daub from Beaker period Scatter D (1, 3 and 4) and Collared Urn pit F.156 (2).*

reals were charred. Of the wheat grains, most were of an elongated 'drop' form typical of either emmer (*T. dicoccum*) or spelt (*T. spelta*). A possible asymmetrical lateral grain of six-row barley (*H. vulgare*) came from pit F125. Cereal chaff was exceedingly scarce; spelt wheat glume bases were noted within the assemblage from ring ditch F.44, but as the number recorded was very low, it is possible that all were intrusive. However, if contemporary, these would constitute an early record of spelt within the East Anglian area. A single possible charred fragment of an indeterminate large legume (Fabaceae) was also noted within the assemblage from ring ditch F.44.

Charred weed seeds occurred very infrequently; most were of grasses (Poaceae) or grassland herbs including brome (*Bromus* sp.), goosegrass (*Galium aparine*) and dock (*Rumex* sp.) although a small number of wetland plants, including sedge (*Carex* sp.) and spike-rush (*Eleocharis* sp.), were also recorded. Waterlogged/de-watered seeds occurred more frequently, in a number of the Early Bronze Age watering holes. Grassland herbs were again predominant, although ruderal weeds and plants more commonly found on disturbed ground were also recorded. The taxa noted most frequently included orache (*Atriplex* sp.), fat hen (*Chenopodium album*), hemp-nettle (*Galeopsis* sp.), persicaria (*Persicaria maculosa/lapathifolia*), knotgrass (*Polygonum aviculare*), buttercup (*Ranunculus* sp.), chickweed (*Stellaria graminea*), stitchwort (*S. media*), dock and nettles (*Urtica dioica*). Wetland/aquatic species were particularly common within the pit/well/tank contexts, with taxa noted including club-rush (*Bolboschoenus/Schoenoplectus* sp.), sedge, gipsy-wort (*Lycopus europaeus*), blinks (*Montia fontana*) and celery-leaved crowfoot (*Ranunculus sceleratus*).

Tree/shrub macrofossils included charred hazel (*Corylus avellana)* nutshell fragments, charred hawthorn (*Crataegus monogyna*) and sloe (*Prunus spinosa*) fruit stones as well as waterlogged/de-watered apple/pear (*Malus/Pyrus* sp.) seeds, bramble (*Rubus* sect. *Glandulosus*) 'pips', birch (*Betula* sp.) fruits and elderberry (*Sambucus nigra*) seeds.

The plant remains from the pit-wells and watering holes, particularly F.125, F.147 and F.185, appear to indicate that these features were situated within areas of rough, damp grassland although it would appear that there was some disturbed ground in the near vicinity. However, it should be noted that this disturbance was possibly simply a result of the

digging of the pits, as while segetal weed seeds are present, ruderal species predominate. The pits themselves were probably wet and muddy for most of the year, although there is evidence to suggest that some were at least semi-permanently water-filled. There is also some evidence that the pits were either surrounded by or partially overgrown by trees, shrubs and rough scrub. Although charcoal/charred wood fragments were present, they were only abundant within the contexts which also contain charred grain, possibly suggesting that while some of these features may contain domestic detritus, others were entirely peripheral to any main focus of human activity.

The only other assemblage of note came from ring-ditch F44. Although small, the assemblage does contain cereals, chaff, weed seeds and nutshell fragments, possibly suggesting that the remains are derived from a small quantity of domestic detritus or hearth waste that was swept into the gully fill.

Pollen analysis
Steve Boreham

Watering hole F.108 was sampled for pollen analysis in the field with two 50cm monolith tins, which together covered a 90cm part of the sequence spanning five different contexts. A sub-sample from each context was prepared for pollen analysis. The pollen concentrations encountered ranged between 37,997 and 97,658 grains per ml. There was some finely divided organic debris which made pollen counting difficult for some slides, but preservation of the fossil pollen grains (palynomorphs) was in general quite good. Assessment pollen counts were made from a single slide. The pollen sums (total number of land pollen and spores counted per sample) ranged between 84 and 130. Although these counts do not exceed the statistically desirable total of 300 pollen grains main sum, four exceeded a count of 100 grains. As a consequence caution must be employed during the interpretation of these results. Percentage pollen data is shown in Table 6.

The samples from this sequence are all rather alike in that they represent meadow and grassland communities, with hazel scrub or hedgerow nearby and abundant evidence for soil disturbance and arable activity. The elevated proportion of fern spores in some of these samples is a slight cause for concern in that it may suggest oxidative post-depositional modification of the pollen signal. However, there does not seem to have been a commensurate increase in robust pollen types such as the Asteraceae, which would be expected if microbial degradation of the pollen signal was in a more advanced state.

Taken as a whole, these pollen analyses show a post-clearance pollen signal, with a variety of habitats indicated including damp meadows, tall herb and riparian (bank-side) communities and hazel-dominated scrub or hedgerow. It must represent a mosaic landscape of pastoral and arable agriculture, with a few scattered trees. Soil disturbance and trampling or poaching is suggested by the relatively large proportions of ribwort plantain, and other members of the plantain family. As a watering hole sequence, there are curiously few indicators of open water, with bur-reed as the only obligate aquatic. The upper-most sample [862] was notable in that it had an increased proportion of bur-reed (9.2%), accompanied by elevated (10.8%) cereal pollen and ribwort plantain (12.3%), and the eutrophication indicator, nettle (*Urtica*). In contrast, cereal pollen was lowest in sample [866], suggesting less arable activity in the area immediately surrounding the feature at this time.

Regionally, these pollen spectra would be typical of assemblages from similar pits and watering holes dating to the Late Bronze Age/Early Iron Age. The fact that they derive from a securely dated Early Bronze Age feature is significant. Taken together with the pollen profile from a very similar Late Neolithic/Early Bronze Age watering hole ('Waterhole 1295') excavated in 2005 from North Fen just to the north of the current site (Verrill 2009), the pollen signal suggests that the decline of oak and lime woodland in the area was significantly earlier than elsewhere in the region. The low quantities of arboreal pollen from Waterhole 1295 appear to represent the last vestiges of woodland within a post-clearance landscape, which seems likely to have resulted from human activity combined with rising water tables (ibid.); significantly, however, virtually no cereals were present within that assemblage. The pollen signal from F.108 represents a stage further in this post-clearance landscape and suggests that this feature post-dates Waterhole 1295; by the time the feature was dug, mixed woodland was absent and had been completely cleared. Furthermore, whilst the habitat seems to have been dominated by grassland, the levels of cereals within the pollen assemblage suggest significant arable activity in the vicinity and a distinct change in land use, which given the radiocarbon dates achieved for Waterhole 1295 and F.108 (2014–1776 cal BC (OxA-19051, 95% probability)[Webley and Hiller 2009] and 1906–1743 cal BC (SUERC-41449, 95% probability) respectively) must have taken place over a relatively short period.

Discussion

The archaeological evidence represents a well-preserved Neolithic and Early Bronze Age site to which the survival of extensive buried soil deposits and the preservation that this has afforded adds an extra dimension. As a result, effective sampling of *in situ* artefact scatters has enhanced the feature-based evidence and provided a fuller picture of activity at the site than is seen at the majority of plough-truncated sites (see also Evans *et al.* 2014). Complementing this, the pollen sequence from watering hole F.108, in conjunction with existing pollen records from the vicinity (including an Early Bronze Age watering hole just to the north; Verrill 2009) has provided a detailed palaeoenvironmental record for the North Fen locale and a framework in which to interpret the archaeology.

Depth (m)	0.14	0.15	0.27	0.4	0.48
Trees & Shrubs (% of total land pollen and spores)					
Betula	0.9	0.9	0.0	0.0	0.8
Pinus	0.9	0.9	0.0	0.0	0.0
Quercus	0.9	0.0	0.0	0.0	0.0
Alnus	2.7	1.9	1.0	0.0	1.5
Corylus	8.0	2.8	15.4	4.8	4.6
Juniperus	0.0	0.9	1.0	0.0	0.0
Herbs (% of total land pollen and spores)					
Poaceae	43.8	38.9	40.4	48.8	29.2
Cereals	2.7	0.9	4.8	6.0	10.8
Cyperaceae	2.7	0.0	1.0	6.0	1.5
Asteraceae (Asteroidea/Cardueae) undif.	0.9	2.8	0.0	1.2	0.8
Asteraceae (Lactuceae) undif.	2.7	1.9	1.0	0.0	2.3
Artemisia type	0.0	0.0	0.0	1.2	0.0
Cirsium type	1.8	1.9	0.0	1.2	0.0
Caryophyllaceae	0.0	3.7	1.0	0.0	1.5
Chenopodiaceae	0.9	3.7	0.0	3.6	0.8
Brassicaceae	0.9	0.9	0.0	0.0	0.8
Lamiaceae	0.0	1.9	1.0	0.0	0.0
Fabaceae	0.9	0.0	0.0	0.0	0.0
Plantago undif.	3.6	2.8	3.8	2.4	4.6
Plantago lanceolata	9.8	9.3	11.5	8.3	12.3
Ranunculus type	1.8	1.9	1.0	0.0	3.1
Rumex	0.9	0.0	1.0	0.0	0.8
Thalictrum	0.0	0.0	0.0	0.0	1.5
Sanguisorba minor	0.0	0.0	1.0	0.0	0.0
Veronica type	0.9	0.0	0.0	0.0	0.0
Urtica type	0.0	0.0	0.0	0.0	0.8
Apiaceae undif.	1.8	0.0	0.0	1.2	1.5
Liliaceae	0.0	0.9	0.0	0.0	0.0
Lower plants (% of total land pollen and spores)					
Pteropsida (monolete) undif.	7.1	13.9	8.7	9.5	11.5
Pteropsida (trilete) undif.	3.6	7.4	6.7	6.0	9.2
Aquatics (% of total land pollen and spores)					
Sparganium type	0.9	3.7	1.0	2.4	9.2
Sum trees (total %)	***5.4***	***3.7***	***1.0***	***0.0***	***2.3***
Sum shrubs (total %)	***8.0***	***3.7***	***16.3***	***4.8***	***4.6***
Sum herbs (total %)	***75.9***	***71.3***	***67.3***	***79.8***	***72.3***
Sum spores (total %)	***10.7***	***21.3***	***15.4***	***15.5***	***20.8***
Pollen Sum (grains counted per sample)	**112**	**108**	**104**	**84**	**130**
Concentration (grains per ml)	**37997**	**63102**	**78126**	**36810**	**97658**

Table 6. *Pollen data from F.108.*

Later Neolithic

The later Neolithic evidence is dominated by the flint assemblage recovered from Scatter C, which was notable not only for its size but for being so well defined both spatially and chronologically. Aside from the scatter, evidence for activity at North Fen during this period is limited; the 2004/5 excavations yielded five sherds of Grooved Ware pottery (Webley and Hiller 2009) whilst pit F.128 is so far the only confidently-dated later Neolithic cut feature recorded at the site.

Scatter C can only be broadly dated to the later Neolithic on the basis of flint technology and although three sherds of Peterborough Ware pottery were recovered from the scatter, it cannot be confidently associated with either Peterborough Ware or the slightly later Grooved Ware style pottery. Having said that, the recent tendency to push the date of Peterborough Ware into the earlier Neolithic (e.g. Beamish 2009) perhaps suggests the latter is more likely. If Grooved Ware-associated, the scatter can be understood in the context of a period, which locally

has a comparative wealth of evidence thanks to the extensive investigations undertaken at Barleycroft/Over where pit cluster sites, isolated pits and surface scatters apparently representing a variety of activities ranging from potentially relatively long-lived settlement episodes to more task-specific episodes have been recorded (Evans *et al.* forthcoming; Pollard 1998).

Whilst the variety of tools present within Scatter C's flint assemblage together with the relatively high quantity of burnt flint does suggest a degree of 'domestic' or occupation-related activity, the character of the flint as a whole appears to be much more indicative of task-specific activity. The comparatively high numbers of arrowheads, and the evidence for their manufacture, suggest that their production and use was a primary concern whilst the notion that the incomplete reduction sequences present within the assemblage represent the transportation of tools and partially prepared cores and blanks to and from the site appears to indicate a high degree of mobility. Given the relatively substantial pottery assemblages recorded at the Over/Barleycroft Grooved Ware settlement sites, the almost total lack of pottery from Scatter C also suggests that if contemporary, it is highly unlikely to be directly occupation related (although our much more limited understanding of Peterborough Ware period settlement in the locale means that the same cannot necessarily be said if the scatter were to date to that period).

It is tempting, therefore to interpret the scatter as the result of hunting-related activity, not least because of the evidence for arrowhead manufacture, whilst its situation, on a raised sand ridge, overlooking the contemporary River Great Ouse and lowlands beyond, would undoubtedly have made the site a strategic location in this regard. Faunal and plant remains assemblages from Barleycroft/Over suggest that the local later Neolithic economy was primarily focussed on exploitation of wild resources together with pig rearing and was very much 'woodland based' (Evans *et al.* forthcoming). In this regard, interpretation of Scatter C as a prolonged or repeated episode(s) of hunting-related activity – forming part of a broader economy still heavily reliant on wild resources – that may well have been undertaken away from an immediate settlement context, appears to make most sense. Interestingly it would also broadly conform to the recent model by Stevens and Fuller (2012) arguing that arable cultivation, which had been pioneered in the earlier Neolithic, may have been all but abandoned in favour of wild plant foods, pastoralism and hunting during the later Neolithic (although it should be noted that there was evidence for limited arable activity at Over/Barleycroft during this period (Evans *et al.* forthcoming)).

Beaker – Early Bronze Age

As demonstrated by the pollen records from Waterhole 1295, excavated in 2004/2005 (Webley and Hiller 2009) and watering hole F.108, by the turn of the 2nd millennium BC, the North Fen locale had been all but cleared of its mixed woodland. Whilst the pollen signal from Waterhole 1295 (2014–1776 cal BC, BC (OxA-19051, 95% probability)) indicates that the last vestiges of mixed woodland still remained when it was 'open', by the time watering hole F.108 was dug (1906–1743 cal BC, SUERC-41449, 95% probability) this had been completely replaced by a habitat characterised by grasslands and the cultivation of cereal crops (it is important to note here that the evidence that watering hole F.108 post-dates Waterhole 1295 comes not from the radiocarbon dates, the error margins of which are wide, but from interpretation of the pollen record). That this habitat is regionally more typical of the Late Bronze Age/Early Iron Age landscape highlights the degree to which it can be considered an early, and apparently rapid, episode of woodland clearance and subsequent arable activity. While this clearance can be considered localised in some respects (pollen analysis from the SUT 7 round barrow site c. 1.5km to the north-east suggested that areas of mixed woodland in fact still persisted in this area during the Early Bronze Age; Connor 2009), it was in other ways potentially extensive. Indeed pollen sequences from the Ouse palaeochannel (Waller 1994) suggest clearance probably occurred at a number of locations along the contemporary course of the River Great Ouse throughout the later Neolithic and Early Bronze Age, while investigations at the Over Narrows suggest that small scale arable agriculture was established at the site certainly by the Early Bronze Age (Evans et al. forthcoming). Whilst rising water tables may have contributed to the decline in woodland generally, the increased cereal signal within the pollen records at this time suggests the clearance was largely deliberate and associated with crop cultivation in relatively 'dry' areas along the contemporary course of the Great Ouse.

It is within the context of this relatively dramatic change in environment and economy that we need to consider the Beaker/Early Bronze Age period at North Fen and consequently, placing the archaeology within a chronological framework of environmental change is important. While the wide error margins mean that the dated features cannot be related to discrete phases of activity, it is clear that they can be considered on a sliding scale of local environmental change occurring in the Beaker and Collared Urn periods (see Fig. 10).

It seems likely that Beaker activity at North Fen (represented largely by pit F.149 and Scatter D) should be understood within the context of the largely cleared, though still partially wooded, damp grassland environment of Waterhole 1295. Although faunal remains identifiable to species are absent from the Beaker assemblages, the presence of charred hazelnut shells in pit F.149 indicate that foraging still probably formed an important part of the economy; conversely cereal grains were present in only very small quantities amongst the plant macro remains and did not register in the pollen record from Waterhole 1295. Having said that, evidence from Barleycroft/Over, for

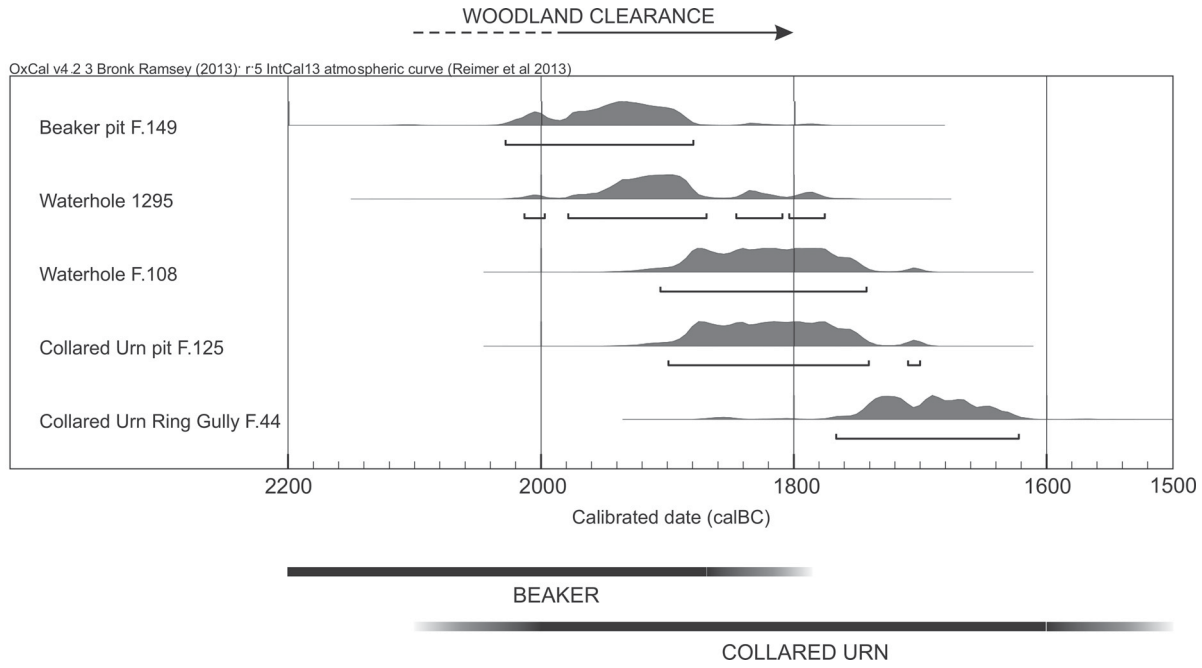

Figure 10. *Calibrated radiocarbon dates of key features (95% confidence).*

example, indicates that arable cultivation was occurring within the wider locale and undoubtedly formed part of the local Beaker period economy (Evans *et al.* forthcoming). There also appears to have been an increase in occupation/settlement activity at North Fen in relation to the preceding later Neolithic. Indeed the buried soil artefact scatter identified by the 2004/5 excavation (Webley and Hiller 2009) together with the evidence of 'increased' activity in the north-west of the excavation identified during the current excavations and the 2009 evaluation (see Fig. 3 and Rees 2010), are suggestive of the widespread residues of occupation. Furthermore, the finds assemblages from pit F.149 (94 sherds of Beaker pottery) and Scatter D (with its Beaker pottery and fired clay assemblage) particularly appear to be the result of more immediate deposition of material from a nearby 'settlement' site(s). The fired clay assemblage from Scatter D particularly is clearly significant and indicative of some kind of structure in the vicinity. Whether this daub-like material can be considered as deriving from a structure akin to a house, or something on a much smaller scale, is unfortunately not clear, however it represents rare evidence of a Beaker structure in the region, a roundhouse (*Structure 1)* excavated at Bradley Fen, Whittlesey, being one of few other convincing and well-dated examples (Knight and Brudenell forthcoming).

Given the radiocarbon date from Waterhole 1295, and in spite of the evident increased levels of occupation during the Beaker phase, it seems likely that the increase in arable activity recorded at North Fen should be associated with Early Bronze Age/Collared Urn activity. Interestingly, however, both in terms of artefact scatters and features, there is less evidence of occupation dating to this period than the preceding Beaker phase. Instead the period is characterised by watering holes and pit-wells situated within a damp grassland environment – albeit one which also saw significant arable activity – alongside funerary monuments of various types. If interpreted as such, the two ring-ditches recorded during the current excavations were apparently part of a relatively significant Early Bronze Age barrow group on North Fen; the Fenland Project recorded five barrows on the 'island' (SUT 3–7; Hall 1996), one of which has subsequently been excavated (SUT 7; Connor 2009). The situation of the barrow groups, on a river terrace, relatively close to the course of the contemporary River Great Ouse, and apparently within a largely open landscape of grassland/pasture, is typical within the region and particularly the lower Ouse environs (see, for example, the Low Ground barrow cemetery at Over/Barleycroft; Evans *et al.* forthcoming). Due to the lack of associated funerary (or other) remains the ring ditches or 'mini-rings' themselves do not warrant detailed discussion (although see Evans *et al.* 2013 for a more detailed appraisal of such features) while their relationship with the Collared Urn 'settlement' features remains ambiguous. Given the relatively 'late' radiocarbon date of ring ditch F.44 (1771–1617 cal BC (SUERC-41463, 95% probability) compared to that of watering hole F.108 and pit F.125, it is tempting to see its construction as coinciding with a decline in settlement/occupation – and potentially arable activity – at the site. However, the presence of charred cereal

remains and nutshell fragments within the gully of F.44, suggest this was not the case and that there was still 'occupation' of some description within its immediate vicinity.

As indicated by the environmental evidence, providing pasture for animals was seemingly a major concern at North Fen. Faunal remains, though limited, suggest cattle and sheep/goat were the primary livestock and many of the Early Bronze Age watering holes exhibited shallow sides suggesting that they were designed for access by animals. The evidence of constant slumping within a number of the watering holes, and the 're-cutting' that was required thereafter, may also have been as a result of disturbance by animals. However, a number of the pit-wells, F.154, F.156 and 'shaft' F.177, for example, were steep sided and evidently for human use. Interestingly, Webley and Hiller (2009) suggest that the timber revetment of Waterhole 1295 also indicated human use. Perhaps the most significant aspect of the watering holes and pit-wells, however, is that they represent an investment in, and an apparent commitment to, the location (*ibid*.). In the same way as the increased arable activity visible within the pollen record, the watering holes suggest long term management and organisation of a resource in terms of grazing livestock and growing crops. The fact that no field system was ever established on North Fen, would appear to confirm that locally at least, field systems are a feature of the Middle Bronze Age and later periods (given that North Fen was apparently abandoned during the later Early Bronze Age). It also, however, suggests that in all probability the field systems of the Middle Bronze Age formalised, in a more archaeological visible way, an already 'managed' landscape (see also Evans *et al*. 2009 regarding the Fengate systems). Indeed Beaker period fence lines preserved by waterlogged conditions have recently been recorded at Must Farm, Whittlesey (Tabor 2010) and regionally it would appear that, in certain areas at least, land management on a relatively substantial scale was occurring during the Beaker/Early Bronze Age period. Further afield, pollen evidence from Middle Bronze Age waterholes at Heathrow Terminal 5 suggests that mature hedgerows at least 500 years old were in existence by the time they were dug (Lewis and Batt 2006) and further indicates the potentially widespread existence of pre-Middle Bronze Age divided landscapes.

While a relatively clear picture of North Fen's Early Bronze Age environment and land use has emerged, the place of settlement in this landscape model is less clear. The Collared Urn pottery sherd count alone – only 23 sherds (ten of which came from a potential funerary context, F.44) plus the small vessel from F.154 – is not suggestive of occupation on any scale, while many of the 79 non-diagnostic sherds dated to the Early Bronze Age on account of their grog temper seem likely to be Beaker. However, to suggest that North Fen was a landscape of barrows and pasture on which livestock grazed – a rather clichéd image of a 'landscape of the dead' – with settlement located away from the site would appear to be wide of the mark. Collared Urn pit F.125 in particular yielded what can be considered a 'domestic' assemblage including finds such as a perforated stone implement and a worked bone point, whilst pit F.156 contained a charcoal-rich deposit, which could be interpreted as 'midden'-derived; both features also contained charred grain and fragments of animal bone (seven of which showed signs of butchery). Furthermore, ring-ditch F.44 itself contained charred grain and nutshells suggestive of nearby 'domestic' activity.

Clearly there was settlement at North Fen during the Beaker and Collared Urn periods, however, from the relatively limited evidence, its scale is hard to grasp and its character hard to define. Such a lack of evidence for Early Bronze Age settlement is not unusual and is well documented both nationally (see e.g. Brück 1999) and more locally. While this may directly reflect less intensive, non-permanent occupation potentially as part of relatively mobile settlement patterns (see *ibid*.; Knight and Brudenell forthcoming), we should also consider that other factors also influence the character of the evidence we see. At Barleycroft/Over, for example, it has been suggested that the lack of well-dated Early Bronze Age (Collared Urn) settlement features is linked to the comparative dearth of pottery assemblages within a domestic context, which could result from a number of factors including the recycling of pottery to be used as 'grog' in further pottery production and the secondary use of vessels in a funerary context (see Šoberl and Evershed in Evans *et al*. forthcoming.). It is also important to note how the recent work at Barleycroft/Over particularly – where archaeological horizons were well protected by overlying alluvial and peat deposits – has highlighted the degree to which as archaeologists we see only 'partial pasts' (Evans *et al*. 2014). Such sites have not only provided a much fuller picture of the activity than is evident at plough-truncated sites, but also serve as a cautionary tale as to how much we can really infer the scale of activity from the surviving evidence at any site. Whilst the North Fen site was very well preserved, large areas had been plough-truncated and much of the evidence for the occupation that is hinted at by the pit assemblages must have been lost. It can, therefore, be argued that by merely considering the artefact assemblages at face value we are underestimating the scale of Early Bronze Age occupation.

Conclusion

The later Neolithic and Early Bronze Age landscape of North Fen was clearly one which saw dramatic change; a change in economy and local environment (the latter as a consequence of deliberate woodland clearance possibly combined with sea level rise), which brought with it a clear change in land use and probably concepts of land tenure. The significance of the evidence lies in the degree to which it reflects changes in the way the North Fen landscape was lived in and exploited over time, from task-specific

activity and the exploitation of wild resources as part of a probable 'woodland based' economy during the later Neolithic, to the arable cultivation and pastoralism within a 'cleared' landscape, and the increased commitment to place of the Early Bronze Age. While the character of the Beaker and Early Bronze Age settlement – in terms of scale, duration and relative permanence – remains hard to grasp, it is clear that the establishment of watering holes during this period represents developing concepts of tenure and land management prior to the establishment of field systems in the broader landscape during the Middle Bronze Age (see e.g. Evans *et al.* 2013) by which time the North Fen island appears likely to have become uninhabitable.

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